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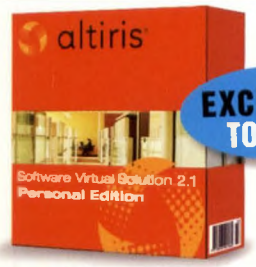

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Based on the commercial Linux distro Linspire, Freespire 2.0 makes Linux easy

Sabayon Linux 3.3b Mini Edition is a powerful and sleek distro based on Gentoo Linux

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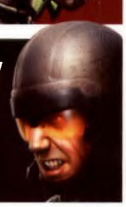

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The BlackBerry Curve 8310 vs challengers from Palm, O2 and Sony Ericsson

LINUX vs VISTA

How the newest distros fare against Microsoft's juggernaut

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contents

HANDS-ON WITH HARDWARE AND SOFTWARE

HARDWARE | SOFTWARE | TECHNOLOGY | GADGETS

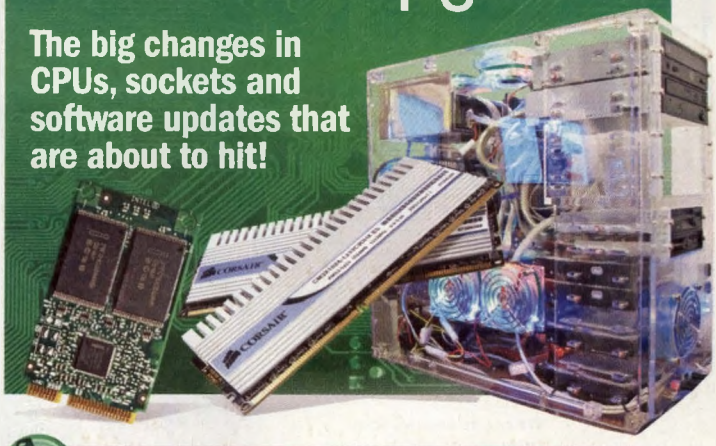
56 | MOBILE TECH
Jenneth Orantia gets out from behind the desk with a sampling of new mobile hardware.

47 | GRAPHICS CARDS
Shane Baxtor looks at the spread of chips from Nvidia and AMD for both gamers and in the lounge room.

98 | SUPERCHARGE TORRENTS
Torrents aren't just for downloading. They're a useful way to share large files of your own, too.

Radical hardware upgrades 72

The big changes in CPUs, sockets and software updates that are about to hit!



technotes

Editorial	Editorial	6
Technotes	All the latest news	8
Feature	The Creators: Craig Mundie	12
Feature	Radical hardware upgrades	72

opinion

Opinion	Hasta la Vista	16
Opinion	Linux Window	18
Opinion	End User	20

feedback

Watchdog	Customer service issues	22
Epinions	Readers' letters	24

apc labs

Labs intro	RAM abounds	27
Reviews	Expression Studio	28
	HP Photosmart C6180	29
	Nikon S50c	30
	Acer Aspire 4920G; Fujitsu LifeBook S6410H	31
	MSI GX600 Extreme Edition; Logitech G9 Laser Mouse	32
	Killer NIC; QNAP TS-209 Pro	33
	Epson Dreamio EMP-TW1000; D-Link DNS-323	36
	ASUS R2Hv	38
	Parallels Desktop 3.0	40
	GuardedID 1.02; Filedoyen 1.35	41
	Nero Linux 3	42
	MS Office Communications Server 2007	44
Challenge	Graphics cards	47
Roundup	Mobile tech	56
Roundup	Linux takes on Vista	61
Best Tech	All the top products	66

broadband

Internet	Broadband news and directory	69

regular features

OS Challenge	A touch of fusion	80
Exploding Tech	Toshiba Portege R500 notebook	82
Insight	Printing ahead	90
Masterclass	Server network for small business	94

ask apc

Tech help	Ask *APC*	84

workshops

Downloads	Supercharge torrents	98
RAID	Professional RAID results	100
Linux	Linux does Windows	102
XSLT	Manage tasks with XML	104

downtime

Gear	Power Tour Guitar; BlueAnt Z9 Bluetooth Headset; iPod nano; BenQ W10000; Logitech G51 Surround Sound Speakers; Microsoft Sidewinder Mouse; Toshiba Gigabeat U201; Sony Cyber-shot H3	108
Games	Colin McRae: Dirt; Alien Syndrome; Two Worlds	110
Chip Chat	The lighter side of IT news	113

on the dvd

BONUS SOFTWARE FOR APC READERS

SOFTWARE | SECURITY | GAME DEMOS | LINUX

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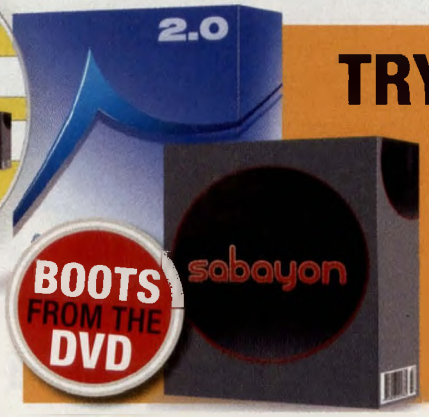

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SABAYON 3.3b

Sabayon Linux 3.3b Mini Edition is a powerful and sleek distro based on Gentoo Linux.

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QUAKE WARS

ADVERTISERS' INDEX

Altech	114, 115, 126
Anyware	116, 117
APCC	5
ARC	129
Avid	37
Brother	89
Compro	111
Corporate Software	120, 121
Dodo	68
Enspire	2
Epson	60, 132
Fuji Xerox	93, 95
Gigabyte	26
Hosting Networks	128
Hosting Shop	129
HP	43
iCute	53
Intel	19
Microgram	127
Microsoft	7
Mindscape	107
Multipli	130
National Communications	124
New Magic	39
Nikon	17
OKI	91
Palit	55
Pioneer	131
Region 4	29
Scorpion Technology	118, 119
Servers Australia	125
TEG	122, 123
TPG	51
Ubisoft	73, 75, 77, 79
UVC	130

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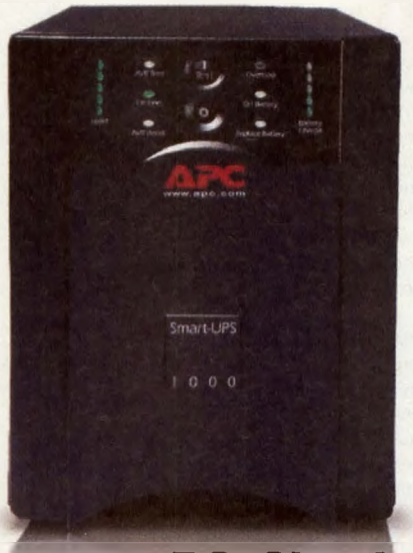

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editorial

TONY SARNO

If you fire up this month's DVD, you'll notice that it has been completely redesigned. The idea behind the change is to go back to basics, to rip out the decoration and artifice of the previous design and give readers a more straightforward interface which highlights the interesting programs that we find each month. Most of all, we've removed the green theme (the design equivalent of spandex disco pants). Version 1.0 of our new disc UI was put together by our DVD editor, Lachlan Grant, so we're keen to hear what you think of it.

Some readers have asked why bother having a DVD now that more of us are on faster broadband speeds and software downloads take minutes rather than hours. The answer is that the DVD carries a lot of software that isn't available for download (such as previous full working versions of commercial software). And, the disc is still the best way to pick up a Linux distribution.

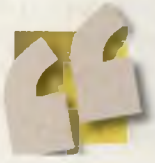
But what I like most about the disc is that it allows us to bring you really interesting new software. One that's blown us away is the Altiris Software Virtualization Solution (SVS), a kind of VMware for applications rather than OSs, which is on this month's disc. The SVS and related technology is one of the reasons Altiris was bought by Symantec. As someone who constantly has to install and remove software on my work and home PCs, I get annoyed that, despite having come so far, operating systems still get gummed up with detritus left behind by uninstalled applications.

I've never quite understood why an OS can't create virtual containers for applications that run them in their own isolated environment. This would prevent software conflicts, it would enable multiple previous versions of an app to be run, and would wipe out absolutely every last trace of the applications once the container is removed.

This is exactly what Altiris's SVS does, so we've managed to get permission to put it on our disc. The version we're carrying is a full working version that comes with a personal licence, which means you can use it without restrictions at home.

Also on the disc, yet more Linux distributions, Freespire 2.0 and Sabayon Linux, which are also reviewed in our Vista vs Linux special in the magazine (see page 61). Linux reminds me of that old saying: "The great thing about standards in the computer industry is that there's so many of them." I am assured that these distros are superb, so, if you can, they're worth a try. For the moment, I'm sticking with Ubuntu . When I installed it on an old IBM laptop a few days ago and it recognised everything, including the wireless connection, I was sold.

tsarno@acpmagazines.com.au



WHAT I LIKE MOST ABOUT THE COVER DISC IS THAT IT ALLOWS US TO BRING YOU REALLY INTERESTING NEW SOFTWARE

NOVEMBER AWARDS

Let's leave the hardware where it is.

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Microsoft

Vista Service Pack 1 finally gets released

With industry experts claiming not much has changed, will the slew of fixes quash user vitriol?

After months of secrecy, Microsoft has finally announced the release of Windows Vista Service Pack 1. A beta version should be available now, followed by a final version release early in 2008. The firm will be hoping that SP1 can stem the flow of user vitriol directed at Vista, which in recent months has grown from a trickle to a flood.

Initial reviews urged consumers and customers to avoid being early adopters and wait for SP1, and Microsoft's attempts to counter that message were lost in endless tales of missing device drivers, file copying bugs and patchy network support. However, Microsoft watcher Paul Thurrott (**www.winsupersite.com**) believes that Microsoft was right all along. "Microsoft had really hoped to convince business customers that Vista would be different and that they would not need to wait for SP1 this time around," he says. "Clearly businesses are still waiting to deploy Vista — but then, businesses always proceed on their own schedules anyway. The SP1 thing is just a red herring, a handy excuse that people use for putting off Vista.

"But give Microsoft a bit of credit: now that we do know what SP1 is, it's pretty clear that waiting for SP1 won't change the Vista equation very much, and that's exactly what the company has claimed all along."

REQUIRED FIXES

While some firms — notably video card companies — have been extremely slow to update their Vista device drivers, alienating power users in the process, Thurrott is "astonished at the high-profile reports I've seen about Vista incompatibilities. . . Microsoft has the data to show that this Windows version is, in fact, the most compatible operating system that they've ever shipped. That said, any major operating system upgrade is going to bring with it some issues, and the data doesn't mean much to the typical customer if they have one printer, or one important application that doesn't run for them in Vista."

Thurrott continues: "Remember that most people acquire Vista with a new machine. And on such systems, everything should be fine."

WAS VISTA EVER READY?

We're not entirely convinced. Bugs in Microsoft Vista — such as the famously slow file copying, moving and deletion issue, which wasn't fixed until July — have taken too long to fix, hefty hardware requirements mean it's a pig on allegedly Vista-capable new computers, and third-party drivers have taken close to an eternity to appear.

Cynics would suggest that Microsoft's own SP1 white paper (see 'So what's fixed?' for further details) proves Vista wasn't ready from day one. Device drivers? Microsoft has added 700,000 since Vista's launch, and applications displaying the 'Works With Windows Vista' logo number 2,076 now but were just 254 at launch. Reliability? SP1 will "target some of the issues Microsoft has identified as the most common causes of operating system crashes and hangs, giving customers a more reliable experience."

In particular, SP1 improves reliability "when working with external displays on a laptop", "in networking configuration scenarios", on "systems that were upgraded from Windows XP to Windows Vista" and "when entering sleep and resuming from sleep." While it's true that users haven't had to wait for SP1 for all of these

Dangerous lithium-ion cells

Demand for smaller batteries tempts makers to take bigger risks.

Scientists at the Tokyo Institute of Technology are warning that lithium-ion rechargeable batteries are not being built with safety in mind. Professor Masataka Wakihara, an advisor to the Japanese government, has reportedly said that "companies are less cautious about designing batteries with a focus on safety".

Toshiba, Sony and Dell have all had to recall models in the last year after several instances of exploding batteries, costing the companies millions. The main flaw with most lithium batteries is the potential for overheating. This has been the case since Sony first introduced them in 1992, but overheating has become a more pressing danger as developments in PC technology outpace batteries and resource-hungry Vista becomes the norm.

Another factor is advances in mobile technology. Wakihara pointed out that today's "mobile device culture" is putting huge demands on batteries. In August, Panasonic recalled 46 million phone batteries made for Nokia after several combusted.

Professor John Owen of the University of Southampton said that, although the risks are low, they may be increasing: "The chances of my batteries exploding are much less than some much more painful events that

Too much of not enough? Vista SP1 is said to not be a major overhaul...

issues to be addressed, they're still all problems that existed after the Vista DVDs were pressed and shipped.

If there's no such thing as bad publicity, Microsoft must be over the moon with the wealth of public criticism Vista has received. In July, Acer president Gianfranco Lanci said that "the entire industry is disappointed by Windows Vista" and said that "stability is certainly a problem", while Dell business manager Niall O'Callaghan said that Dell was "stepping back" from recommending Vista upgrades and noted that "enterprises are not investing as much effort in moving [to Vista] as we'd like them to." Two short weeks after that, Lenovo chairman Yang Yuanqing announced that the 2008 Olympics would run Windows XP, not Vista, because "the Olympic Games require mature, stable technologies".

Vista's much-hyped gaming focus seems to be falling flat too. Gamers are a key target group, but, in August, Valve Software's Gabe Newell reported that just eight per cent of the people using Steam — Valve's digital distribution and online gaming platform — were using Vista. He also stated that Microsoft's decision to make its DirectX 10 graphics technology Vista-only was "a terrible mistake".

Demand for Windows XP remains so strong that Microsoft has had to develop an interim service pack for XP — 2c — so that system builders won't run out of product keys. Although XP Professional will be retired in January next year, system builders will continue to sell it until January 2009, and Microsoft has revised its financial forecasts to account for higher than predicted XP sales (22 per cent rather than 15 per cent). Meanwhile, UK-based Dixons Stores Group, owner of the PC World chain, has told investors its "gross margins have been materially impacted as a result of... lower than expected demand for Vista products."

NOT MUCH CHANGE

Thurrott agrees that SP1 is hardly revolutionary. "I can — and have — complained that Microsoft should have been more upfront about SP1 all along and explained very clearly that it was just an aggregate of previously-released fixes for the most part. Why they were so secretive about it for several months we may never know. Now that it's a known quantity, it's pretty easy to see that it will not change the 'Vista experience' — sorry, I hate that term — very much at all. So there's no need to wait for SP1. You're either going to upgrade to Vista or you're not. SP1 doesn't change much at all."

SO WHAT'S FIXED?

According to senior product manager David Zipkin, SP1 is "not a feature delivery vehicle". Microsoft's SP1 white paper, published on the Official Vista Blog (*www.windowsvistablog.com*), says that SP1 will include the following:

- Improved reliability when using external displays, networking, printing, sleeping or using a Vista machine upgraded from Windows XP.
- Performance improvements to network browsing, file copying, IE7 and Hibernate/Resume modes.
- Improved BitLocker drive encryption and a new encryption generator.
- Changes to the Group Policy Management Console.
- Enhanced network diagnostics.
- Support for the exFAT file system, SD advanced direct memory access and EFI.
- Support for Secure Socket Tunnelling Protocol.
- APIs for third-party security software applications.
- Improved security for RemoteApp programs and desktops.
- Direct3D 10.1.

When released, SP1 will come in two downloadable versions. Express only downloads the changes required for a specific computer, while Standalone is the whole thing, designed for deployment on multiple PCs.

fate may have in store," he says. "However, there's always a trade-off between performance and safety, and the continuing demand for smaller batteries tempts manufacturers to reduce the distance between the electrodes, risking higher probabilities of ignition."

In August, Sony announced it was spending US$99M ($118M) on a new battery plant in Singapore, where a more advanced lithium-ion polymer technology would be used to produce its batteries.

Texas battery maker Valence, meanwhile, claims that its lithium phosphate technology is stable and will not burn, even under extreme temperatures.

Nokia recalled its BL-5C mobile phone battery due to safety fears.

A number of Dell laptops have self-combusted due to battery problems.

Beyond Web 2.0

APC probes the realities of web application development with Rick Ellis, the founder of Ellis Lab.

APC: What's the current state of Web 2.0? Where are we on the continuum?

Rick Ellis: What is Web 2.0? Simpler sites? Peer-based communities? Standards compliance? Big fonts? The term 'beta' in the site title? Do we really need a label for all that? Call me contrarian, but I find the whole 'Web 2.0' thing a little contrived.

APC: What lessons have you learned about developing web applications recently?

RE: I don't get caught up trying to chase every new hyped idea. Every day, it seems, there's a new buzz on the internet: AJAX, OpenID, MicroFormats, Podcasting and so on. It's often better to stay on the trailing edge of technology, since many new ideas never reach a critical mass. Unless your development resources are infinite, it's much wiser to invest in sound ideas that benefit the majority of your users, holding off on new technologies until they've clearly shown value.

APC: That said, how would you describe the trailing edge?

RE: Trailing edge simply means being more conservative when adopting technologies. For example, we use PHP as the scripting platform for our products. PHP version 5 has been out for about two years, yet less than 10 per cent of hosting companies support it. Most are still only offering PHP 4, which is nearly seven years old. This stops us taking advantage of all the great features of PHP 5. We're still developing for PHP 4.

AJAX is another good example. Finally we've reached a point where the major browsers support the JavaScript Document Object Model well enough, and enough users are using those browsers, to make using AJAX reasonable. A couple of years ago it would have been irresponsible to incorporate AJAX into our products, even though it was getting a lot of buzz and many developers were rushing into that realm.

APC: Do you think it's risky having everything off desktop and on the web?

RE: The web as it's currently constituted isn't a great medium for most desktop applications, so we're still many years away from having to think about this proposition.

APC: What needs to change for the web to be much more viable as an application system?

RE: A few years ago, Java Applets were all the buzz. The concept was that, simply by loading a web site, an application could be loaded along with it for use within the browser itself. Although the theory was quite compelling, in practice, applets never worked very well. Browsers didn't support Java reliably and bandwidth issues were a major problem at the time. But the concept is sound: real applications that load at runtime just by loading a web page. I think that we'll need to see the emergence of browser-agnostic tools such as these before applications can truly be web-based.

APC: What makes a web product compelling?

RE: Popularity. I find MySpace, for example, has a terribly crude interface. It's about as non-Web 2.0 as you can get, yet it's immensely popular. I'd call MySpace very compelling, despite the fact that it assaults my sensibilities.

APC: What are the differences between design and development for a specific customer versus a web application?

RE: The process is similar in both cases, but when designing for a client you only have one person's requirements to consider. The broader web requires you to consider the needs of thousands of users, and you must provide broader support, sales and training infrastructure.

THE (A)PC REVOLUTION

November 1987

FIRST 386-BASED LAPTOPS

Having reviewed two 386-based portables from Toshiba and Compaq, the *APC* reviewer says: it would be wrong to think that no user will ever need portable machines of this level of performance in the future.

4TH DIMENSION

Once known as Silver Surfer, 4th Dimension is the database the Mac has been waiting years for. . . 4th Dimension is a relational database management system. It joins Double Helix 2.0 and Omnis 3 Plus as one of only three Macintosh software packages that can be used to develop customised standalone data management applications. (At the time this review was written, Ashton-Tate's dBase Mac was still not released.)

DOUBTS ABOUT OS

Doubts about Microsoft's OS/2 operating system have been boosted by the discovery of a chip that makes it look obsolete before it's available. The chip comes from Intel itself. Rumour in Silicon Valley points to a half-size 80386 chip for early next year. It would probably be called 80388, after the 8088 (which was the 8-bit version of the 8086). . . unfortunately, the new whiz-bang operating system from IBM and Microsoft is OS/2, and that has to work on 80286 machines. Therefore, it can't take advantage of the really nice software protection (able to run PC programs in protected segments) that is built into the 386.

Metadata from digital photos is being used to track down criminals.

Metadata used to fight fraud

Be careful. The photos you take could be eroding your privacy.

The police are now using digital fingerprints embedded in mobile phone and digital camera images to track down and arrest people that infringe copyright laws. Be warned that your last set of Flickr uploads almost certainly included metadata about your camera or phone that could be tracked back to your home address.

An Australian user found that he couldn't hide his identity when he recorded the new *Simpsons* movie on his phone and uploaded it to a peer-to-peer file-sharing site. The metadata in the movie file contained his phone's serial number and, since he'd registered his phone with its manufacturer, the police were able to track him down. He's now helping them with their enquiries.

The embedded ExIF (Exchangeable File Image Format) data that helped the police to find this fraudster can contain lots of information about the camera or phone that took the photo. There's a handy utility, ExifTool (**www.sno.phy.queensu.ca/~phil/exiftool**), that displays the metadata stored in your digital photos. Google's Picasa (**http://picasa.google.com**) can also display ExIF metadata.

For most users, the metadata that their images and other digital documents contain is benign, but when coupled with the database of registered users of a digital camera, for instance, it can become a powerful weapon when fighting copyright crime: "In theory, we can find out which country the camera was sold in and, in turn, the warranty and service centre records in that country could be checked. It would take a lot of work, but there's a good chance they could find him or her," says Vic Solomon, Canon's product intelligence officer and expert on metadata tracking.

To protect your privacy when using social networking sites, check the ExIF metadata that's embedded in your images before you upload them. Use simple utilities like Opanda IExIF (**www.opanda.com/en/iexif**). Stripping out personal metadata from an image is a good idea, as is thinking twice before registering your phone or camera with its manufacturer, if you're concerned about your privacy.

Want to nominate a dumbest moment in tech? Send an email with the subject line "Dumbest Moments" to dwarne@acpmagazines.com.au. All correspondence becomes the property of *APC*.

HOUSTON... WE HAVE A PROBLEM!

You'd think it would be a relatively simple matter to put some sophisticated, shielded computers into something like the International Space station. So, when the ISS's computers crashed again recently, we were surprised to learn that the two main systems that control the space station's orientation and supply of oxygen and water are based on 80386SX-20 processors (with 80387 co-processors!). Worse, they have been failing on a regular basis for years, partly because, when they were first designed for the ISS, the issues of running them in space were not fully understood. In the last problem, a faulty power switch kept shutting down the computers, forcing ground control to work with the astronauts on a fix. The cause was later identified as a surge of power from new solar panels installed on the station. But the biggest long-term issue has been inexplicable crashes, which have been attributed to the hard drives. Initially, the drives were just like those of ordinary PCs, but, in zero gravity, it quickly became apparent the heads weren't getting the necessary air cushion to float on. They were replaced by solid state drives, but cooling became an issue: no flowing air to cool them.

Bill Gates' replacement: Craig Mundie

According to Craig Mundie, there's still room for Windows to gain even more market share. Oh, and Google's success is all down to Microsoft. *Dan Warne* reports.

On July 2008, Bill Gates will hit Ctrl+Alt+Del and log off from the Microsoft corporate network for the last time. The self-made billionaire is swapping his role as the most powerful man in tech for the quiet life of a (billionaire) private citizen. Craig Mundie will be his replacement, along with Ray Ozzie, who will share the role.

Ozzie will be Microsoft's chief software architect, looking after technical strategy and product architecture, while Mundie will set Microsoft's strategy across the board and head up all of Microsoft R&D.

APC: Craig, what does it feel like to be taking over from the most powerful person in tech? What passions do you feel you are bringing to the role?

Craig Mundie: Well, I have been Bill's closest partner on many of the long-term technology, strategy and research projects for almost ten years now. So I have quite a bit of personal familiarity and share many of the same passions that Bill does. I'm passionate about the importance of sustaining a long-term investment in fundamental computer science research.

As we partition Bill's role between Ray Ozzie and me, the part that I particularly picked up is the management of our global research operations and where we maintain the focus on investigations of these longer-term concepts.

APC: So, what are your observations of the tech industry after having worked in it for so long?

CM: Well I think I have learned quite a few things, but I guess one is the importance of patience. I came to Microsoft 15 years ago to start 'non-PC' computing. At the time, Bill could anticipate that the microprocessor would get more powerful and shrink physically, and we would end up putting it in a lot more things than just PCs.

Of course, then, the world was strictly focused on the desktop computer and traditional IT kind of environment. So, today, 15 years later, what we started in 1993 is only now coming to substantial market fruition.

One of the things that I've learned is it is easier for us to think about the technology and how it is likely to evolve than it is to get the world to quickly move to take it up at scale.

I think one of my big learnings has been that it is a big challenge to change society's infrastructure. That has been really what Microsoft has been a big part of doing in the area of IT globally. When you look at each new area, whether it be smartphones or interactive television, or essentially another generation of game consoles, we have been able to understand what it takes to build these things even though we always face a substantial challenge to get the critical mass.

APC: Vista has been criticised for having too few improvements over XP. However, having followed the betas closely and interviewed some of the Vista developers, what is evident to us is that there is an enormous amount of functionality waiting to be tapped, like the

PROFILE

Mundie previously held the position of Microsoft chief technical officer of advanced strategies and policy, in which he worked with Gates to develop comprehensive technical, business and policy strategies for Microsoft on a global scale. In addition, he worked with government and business leaders in Washington, DC, and across the globe to address the technology and policy issues of security, privacy, telecommunications regulation, intellectual property and software procurement standards.

He is working closely with Microsoft chairman Bill Gates to assume responsibility for the company's research and incubation efforts – in anticipation of Gates' departure from a day-to-day role in Microsoft in July 2008.

Bill Gates, Craig Mundie, Ray Ozzie and Steve Ballmer: Microsoft's current top four. As of July next year, the fantastic four will be reduced to the terrific trio (OK, we'll stop now).

And this was the very first pirated copy of Windows 3.1...

Ray Ozzie: our profits are "this" big.

Windows Communication Framework and Windows Presentation Foundation. How long do you think it will be before the developer community hooks into Vista's 'hidden features'?

CM: The way I think of platforms and their evolution broadly is that they always go in cycles, and the cycle has two components or two waves to it. The first wave I call the diffusion cycle and the second the exploitation cycle.

Developer communities really only function in the large in the exploitation phase, and the platform has to largely be established at scale before people move to really capitalise on its intrinsic capabilities.

So, the diffusion cycle is always driven by a small number of similar applications or things that have broad appeal. That tends to get the platform out there and, once it's out there, you can then educate people about these other benefits and they essentially move gradually from their platform model to the new platform model.

Microsoft has done that successively, over and over again, even in the evolution from DOS to Windows, then to Windows NT-based technologies and now on to Vista.

You'll see that the same thing is happening between generations of phones, game machines and IPTV technology.

So Vista is in its diffusion cycle and, until there is enough of it out there, you won't really see the developer community come across.

So far, we have delivered about 60 million copies. That would represent about six per cent of the global Windows install base. So it has probably got to get up another few percentage points before you will start to see a big migration of the developer community.

But I think that the tools are there to support that. More tools are coming online that I think are also important, like the Silverlight technologies and of course the .NET framework, which has been broadly adopted now.

So those things come together and then you get this big shift. I don't think it will take many, many years, but I don't think it will happen in the next few weeks either.

APC: So, Microsoft's big money-makers are still Windows and Office, right? Is there going to be an inflection point where Microsoft stops relying on desktop software revenues and focuses on online services?

CM: No I don't think so, because our view right now is that the future is really about these composite experiences of locally running software in the client devices, working in conjunction with services that exist in the internet cloud.

Some of those services are infrastructural and some of them are experience-specific. We have been working for the last few years to add the service component to both the platforms in almost every single Microsoft software product. I think there was a period of popular mythology, where everybody was saying the whole world is going to migrate to 'software as a service' over the internet. We absolutely don't think that is true, and I think it is increasingly recognised as not likely to be true.

Rather, what will happen is that you'll have a seamless integration of locally running software in increasingly powerful client devices (not just desktops) and a set of services that work in conjunction with that.

A lot of what we are doing with the Live platform not only allows us to provide the service component for our parts but also gives the abilities for the developer community to perfect their composite applications and get them deployed at scale.

APC: So do you feel that is a major competitive advantage over Google for example? That you have the desktop software expertise along with online services?

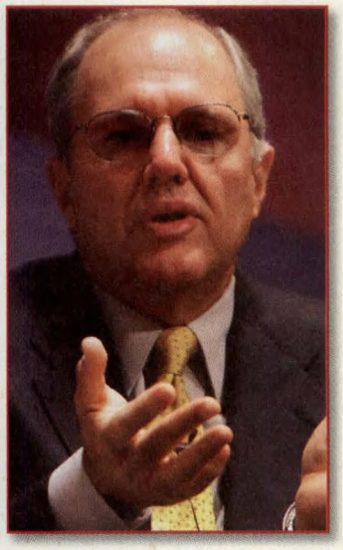
CM: Well, yes and no. I mean, the fact is: Google's existence and success required Microsoft to have been successful previously to create the platform that allowed them to go on and connect people to their search servers.

> GOOGLE'S SUCCESS REQUIRED MICROSOFT TO SUCCESSFULLY CREATE THE PLATFORM TO CONNECT PEOPLE TO THEIR SEARCH SERVERS

Now, Microsoft's business is not to control the platform per se, but in fact to allow it to be exploited by the world's developers. The fact that we have it out there gives us a good business, but in some ways it doesn't give us an advantage over any of the other developers in terms of being able to utilise it.

For example, as much as our Virtual Earth product uses a lot of local 3D rendering technology, so does Google Earth. So I think there will be other ways in which we distinguish ourselves and

"So if the PC bluescreens during the demo, I just get the tech guy over there to reboot it..."



where our knowledge of the platform and ability to continually evolve it will be a business advantage for us.

It is just the difference between being part of the infrastructure of the internet as well as competing directly in the service or client capability as well.

APC: I wanted to ask you about the problem of legacy software in IT, especially because the new Office Open XML Standard was rejected today, and some of the complaints were around legacy aspects of it like 'Word 95 character spacing mode', which Microsoft was unable to articulate as part of the standard...

CM: We should talk about some of these issues...

APC: Sure, but the question I was going to ask was: is there some merit in Apple's approach of simply cutting off legacy compatibility quite frequently?

CM: You know, it's a luxury to be able to leave your past behind, and if you have a relatively small installed base and you are essentially moving more into consumer-oriented things, you can be a bit more cavalier about that.

What the world looks to Microsoft for is the stable infrastructural component and many core technologies that run other systems. If anything, they want us to be very methodical and discerning about how we move forward and the rate at which we [render] obsolete the things that we have left behind.

We have been under continuing pressure from our customer base to extend the life cycle of support for many of our products and have done so for as long as a decade on many occasions.

APC: So, getting back to the Office Open XML Standard...

CM: Yeah, so a couple of things. Firstly, the standard wasn't quite rejected. We are in the middle of a long process which won't be completed until spring of 2008, where the final decision regarding standardisation will be complete. We were actually quite enthused with the number of countries, even at this stage in the balloting process, who voted to approve the standardisation at the current level, while there were a number of countries who either abstained or voted procedurally 'no with comments'.

So we have now entered this 'valid resolution meeting phase' where the standards body drives a process, which we obey and are committed to, to work through the comments that were raised by people as we move forward in this area.

There are a lot of people who have raised a great many issues which we don't think have a lot of practical merit but serve the purpose of creating some anxiety during this process. Many of the comments that were submitted had common threads and were put together by people who oppose this activity.

So, given all of that, we were actually quite positive about the fact that we came within literally a couple of countries of having the thing ratified even at this point.

We are fairly confident that, having looked at the comments, that certainly most of them will be readily resolved and that a lot of the countries who voted 'no pending comment' are likely to switch to a yes. We literally only need to get a handful of those to convert in order to get ratification.

We view it as a relatively positive outcome. We certainly would have preferred that it had gotten ratified at this point, but we are not at all deterred from thinking that people will ultimately endorse ISO standardisation.

APC: So, moving to something different... given so many of *APC*'s readers are Windows users and fans, can you give them a sneak peek into the future of Windows into the next version?

CM: I can't really give you a sneak peek into the next version of Windows per se. My time horizon is actually kind of longer-term than that, so what I might do is to talk about the kind of things that I think your readers might be interested in — the time horizon beyond the next version of Windows.

One of the things that is changing over the next five to 10 years is that the industry will fundamentally change the architecture of the microprocessor and, with that, will create a new level of capability in these machines.

I think it is likely, in that time horizon, that the current price and power levels that we think of as today's microprocessors are likely be 50 or even 100 times more powerful.

These should give us the basis of making qualitative changes in what people expect from these computer systems. So, things that the industry has traditionally struggled to achieve, like perfect dictation or multilingual support, will be changing the experience of man/machine interaction significantly.

Future Windows will work on massively powerful processors.

Linux vs Windows: Mundie believes Microsoft can win even more marketshare.

> IT'S A LUXURY TO LEAVE YOUR PAST BEHIND. IF YOU HAVE A RELATIVELY SMALL INSTALLED BASE, YOU CAN BE MORE CAVALIER ABOUT THAT.

Some of these things may be on the horizon at levels that will surprise people. If we can master the necessary architectural changes, it will provide computing capability that is substantially greater than anything we have experienced today.

So, despite the power of the machines that people have on their desk today, we really still think that this whole evolution is in its infancy and, over that longer-time horizon, we are likely to see some fairly dramatic changes.

That is one of the reasons we keep investing in new technologies for writing and expressing programs, new models of integrating them and for operating them across the internet or multi-machine environments.

We are very enthused about that on a longer-cycle basis and expect that that the Windows franchise will continue to move forward to avail everybody of these capabilities.

APC: So, speaking of the changing architecture of microprocessors, one of the big hurdles the software industry is facing at the moment is adopting new programming methods to take advantage of parallel processing. Have there been any leaps forward within Microsoft recently in that space?

CM: Well, they are out there — although most of them are not public yet. We have been very focused on this in our research organisation for the last five or six years, and we're increasingly optimistic that there will be tools that will facilitate the construction of highly concurrent systems.

One area that your readers might want to explore as a precursor to some of this is the Robotics SDK that the company started delivering on the web last December. It is a new product for Microsoft, and an area that we haven't historically been in, but many of the tools and technologies that are in our Robotics studio SDK are precursors of the kinds of tools that the broad developer community will find interesting as they have to construct larger-scale, highly concurrent applications.

The Robotics SDK, for example, has a visual programming model where people can wire up concurrent applications that are actually running concurrently on multiple machines but which are heterogeneous in architectural sense. It has a concurrently controlled runtime that basically deals with a lock-free synchronisation architecture, along with a new set of system services that operate in a highly distributed architecture.

Many of these things would be interesting to your readers, not because they reflect specifically what we would see in the traditional Windows environment, but because they show that the company is advancing the state-of-the-art in programming models and tools. I think these things will ultimately inform the more mainstream developer environment.

APC: What are your thoughts on the sudden availability of Linux on desktop PCs through big-name PC manufacturers like Dell, Acer and HP?

CM: Well, I don't know whether I think it is a great threat to Windows. I think that there is a contingent in the marketplace who want to experiment with those technologies or have environments in which they want to deploy them.

If there was some sudden adoption of this at some much greater scale than we've seen in the past, certainly that would represent a greater impact on our business.

But many people predicted a few years ago that the same thing was going to happen in the server business and, in fact, last year was notable in that it appears that the Linux server marketplace plateaued in terms of growth, while the Windows server business gained share.

That was a surprising result for many people who predicted that that Linux share would inevitably increase, but, in fact, it didn't, because I think people came to understand and value what they got for the money when they bought products from Microsoft. They realised that there were other factors than initial purchase price that play into the ultimate long-term economics associated with running systems.

So, I have no reason to believe right now that we, over a period of perhaps three to five years, wouldn't see soft share gains at the desktop level. Globally, we can continue to provide a value proposition that will keep us in a relatively stable share position.

APC: Thank you very much for your time. It's been very interesting to talk to you. Best of luck with your new role.

Vista SP1 released

Vista SP1 is in beta... should you wait for it? And what will the overall effect be on Vista users and migration generally?

With the beta of Vista Service Pack 1 being released for private and then public testing and comment, there's been quite a bit of speculation about whether the service pack will have any impact on migration to Windows Vista.

Certainly, at the start of the year, there was plenty of comment that users would prefer to wait until SP1 was released before moving away from earlier versions of Windows. This reluctance had little to do with expectations about the quality or contents of Vista SP1 but rather demonstrated an unwillingness to commit to a new operating system until the first recognisable milestone in its life cycle after the initial release.

This is fair enough as it goes, although Microsoft was certainly at pains to try and get people moving across to Vista faster than that, especially businesses. The reluctance to jump headfirst into Vista comes from, in part, the long-standing maturity of Windows XP, and the fact that the most recent popular SP release (Windows XP SP2) was actually over three years ago. Doesn't feel like it, does it?

In user memory, service packs are a big deal and something you have to pay close attention to. For IT administrators, this is especially the case. Windows XP SP2 was a major update and quite radically changed the way XP was administered, and, at the time, if you'd known that SP2 was on the horizon, you would have held off migrating to Windows XP until SP2 was released.

Vista SP1: probably not a radical update like XP SP2.

> THERE'S LITTLE REASON TO SUSPECT A PRE-SP1 VISTA MACHINE IS INFERIOR

But SP2 was extremely atypical of Windows service packs, which are for the most part essentially rollup packages of previously-released security/software patches and don't tend to incorporate radically new feature sets.

Having installed and analysed Vista SP1, I can definitely state that this service pack is well back in the realm of traditional service packs. There's one small feature update that enables you to create a Recovery Disc, but the rest is dedicated to security, performance and stability updates, and a kernel update to bring Vista in line with Windows Server 2008, which is due for release at the same time.

One of the things which stood out strongest was how much better even an SP1 beta machine seemed to perform and respond, as compared to a base Vista machine, and some people may see this as a validation of their decision to wait.

But there's little reason to suspect that, by the time SP1 is released, a pre-SP1 Vista machine will seem inferior. Vista has very close ties to Windows Update, and Microsoft has been proactive in making updates available since its release. There have been very few critical updates, especially compared with Windows XP at the same point in its life cycle, and there have also been performance and stability updates which fix a number of niggling problems in Vista. Microsoft seems quite comfortable now with releasing non-critical updates outside the cycle of service pack releases, so we can quite confidently expect to see updates destined to be bundled in SP1 released ahead of time once they've passed beta testing.

Therefore, a pre-SP1 Vista machine should have all the necessary updates available via Windows Update or through Microsoft Support to be running at the most up-to-date level possible at any given time. This should be a reassurance to users who had SP1 as their starting point to migration. My advice is that SP1 isn't a radical update like XP SP2, so don't feel you have to wait for it before you buy Vista. Windows Vista SP1 is due for release in early 2008. apc

HastalaVista

by James Bannan

James Bannan is a systems manager at St Leonard's College (Vic) and APC's resident Windows expert. He'll be checking out Vista for you every month.

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Right on time

Sync your setup and we'll have all the time in the world.

Collaborative projects are common on the web. Indeed, they practically feed, design, evolve and chart its future. But they don't always have to be huge, and you don't have to be limited to the communities for which your knowledge or time can contribute.

In fact, speaking of time, there's one very simple but necessary service on the net that millions of computers around the world use every day, possibly even yours — the time servers. Seeing as we run our lives by the clock, it's not surprising we need to ensure our machines do the same. Computers live and die by the clock in more ways than one if you delve into buses and signals and time slices, but on a less granular level there's your system's time-keeping service, the clock you look at to see whether it's time to go to lunch.

A common complaint with our PCs is, funnily enough, how they often fail as a time piece: clock drift is common, sometimes exasperated by software, and can be more problematic than simply making you late for a meeting — timestamps on files can become mismatched for file synchronisation, media centres are going to want accurate clocks for recording, compilers may barf errors and more. While the cause lies with the quartz crystals at the core, which are inherently inaccurate (though accurate enough for the task, not to mention cheap as well) and can be influenced by temperature and interference, the problem can be mitigated by synchronising time with an outside source.

Which is exactly what NTP (the Network Time Protocol) is designed to do. Correct time is essential for critical applications and business networks and NTP is frequently used here, but SOHO and home machines are often neglected. You can, however, remedy this relatively easily — both Linux and Windows allow you to synchronise your PC clock to local NTP servers.

The key here is local — both operating systems have a habit of being tailored to the US and European markets, and the selection of NTP servers is frequently out of date, or even absent, for our shores. Fortunately, the NTP pool project aims to provide a reliable NTP server network across the globe, including a dedicated pool for us Aussies down under.

Regardless of how many available time servers there are — around 40 at the time of writing (compared to 500 in the States and 800 in Europe) — you can synchronise your system's clock via the Australian pool: under Linux just make sure the NTP package is installed and then add four new servers to the NTP configuration file or via the clock on the Gnome desktop (for Ubuntu and similar distributions): 0.au.pool.ntp.org to 3.au.pool.ntp.org. Under Windows, one of these can be entered via the internet time tab on the clock.

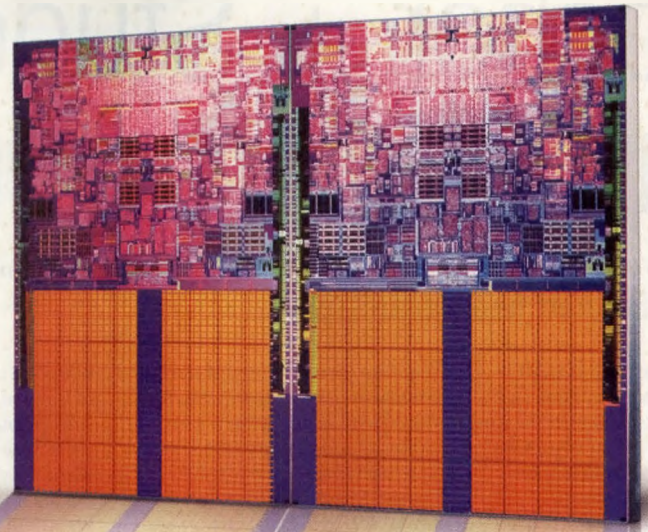
> COMPUTERS LIVE AND DIE BY THE CLOCK IN MORE WAYS THAN ONE

There's a wonderful science behind the stratum levels of NTP servers which stems back to original atomic clock sources, but back to the collaborative part — while not everyone will be able to help, if you can provide a machine with a static IP and don't mind a little bandwidth use, you can set up a system to become a part of Australia's NTP pool for others to use. With more and more machines using the protocol to keep clocks in sync, new servers are always welcome. If you'd like to help, check out the joining page on **www.pool.ntp.org**, which also lists hints on how to make the most of it. And remember, your PC likes to stay on time as much as you do! APC

LinuxWindow

by Ashton Mills

Editor of the **Linux Pocketbooks** *series, and now with CHOICE magazine, Ashton has been a tech journo for over 12 years, including five years with* **APC**.



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Teacher + Student = dumb and dumber

We had no idea there were so many dumb IT trainers and students out there. The stories just keep coming in.

Reading last issue's dumb trainers and students stories, David Tune of Boambee, NSW, was reminded of a particularly clever pair of IT Diploma students who handed in a joint research assignment, complete with the required signed statement that it was all their original work. Tune recalls: "Upon reading the work for grading, I was incredibly impressed to find three pages of the document written in perfect technical German, particularly given that the students in question were none too articulate when I asked 'sprechen sie Deutsch?'. End result: assignment rejected, students counselled and more care taken when cutting and pasting to cover assignment work."

THAT'S MY LECTURE

Anyone attending an IT lecture should expect that the lecturer knows the subject. But IT lecturers are a funny lot. Reader Jun Li, a programmer, recalls working in IT support at a school. "I was told to set up a projector in one of the meeting rooms for school staff, as there was a presentation. Having done that, I hooked the presentation laptop to the network and tried to help one of the speakers from the IT faculty update the laptop to IE7. I logged off and asked her to log on with her account to try IE7. 'What is that?' she asked when the IE7 install process asked whether phishing should be turned on. After I explained it, she told me that she was about to present a talk on internet security."

TUTORING THE TUTOR

Reader Neil Meyers, library assistant from Gilles Plains in SA , recalls an incident with a part-time computer lecturer a couple of years ago. "I work in a vocational education library, and, on night shift, library staff are the default computer technicians/troubleshooters. One night, this part-time lecturer came to the counter, stating that she'd managed to get a CD-ROM disc stuck in the drive. She also said she felt a bit foolish, because she was instructing a class in basic computing and was unable to solve the problem in front of a room full of students. So I wandered over to give her assistance, pushed the drive eject button, out popped the tray and... no disc to be seen. Before I was able to ask the obvious question, she piped up, 'That's the CD drive? I thought it was the other one!', pointing to an old 5.25in floppy disc slot, which was there even though the drives themselves had long since been decommissioned. Someone from IT got out the disc the next day when they upended the machine and it fell out. Then, a week later, after I gave the lecturer her CD back, she was back within five minutes, saying, 'You won't believe it, I've done it again!' And this was their computing tutor? So there I am in front of her class, shaking the heck out of the machine. So much for teaching people to handle their computers with care!"

WHAT'S A FLOPPY?

It's not just computer tutors that get stumped by floppy drives. Senior managers do too. Rodd Young works as the systems administrator for a shire council in Queensland. He says: "The other day, one of the senior managers ran in my door at five minutes to 5pm and said, 'Can you come and help me with my computer?' 'What's wrong with it?' I asked. I was told:

EndUser

from The readers of *APC*

APC readers who deal with new computer users or incompetent IT administrators share their survival stories.

"Unfreeze or I'll shoot!" The boys in blue don't always make the best tech support.

> I HAD TO BITE MY LIP TO STOP ROARING WITH LAUGHTER AS I TOLD HIM IT WAS A FLOPPY

'I received a smaller business-sized CD with a phone that I recently got and I was trying to install the software. I put the CD in the small CD tray and now I can't read the disc and it won't eject either.'" Curious, Young walked around to this senior manager's office and asked him to show where he was inserting the small CD. "The manager pointed to the floppy drive under the CD tray and said, 'The disk was too small for the normal CD-ROM drive, so I put it there.' I had to bite my lip to stop from roaring with laughter as I told him that was a floppy drive. The blank expression and the 'What's a floppy drive?' was too much." After Young prised the CD out of the floppy drive with a pair of tweezers, the manager pleaded that he not tell anyone. "My reply: 'I'll be sure to forget about this at the Christmas party awards.'" To comply with the senior manager's wishes, we'd also like to ask other readers not to pass this on.

NOW, LISTEN AGAIN

Angela Bletas, an IT support officer from Monash Uni, sometimes wonders how some staff and students actually get by using technology. "One day, the service desk got an email from a staff member saying she could not find her D drive and her shared network drives (her computer had recently been re-imaged, and the image for some reason did not have a D drive, only a C drive. She was unable to save things to D drive, as D drive was the DVD-ROM.) I explained that her work was on the C drive and that the reason she could not see her network drives was that she was in icon view, but once she changed it to List view, they would appear. It was all to no avail. She sent out another email some days later, stating she still could only find D drive, and that all her shared drives were missing and was unable to complete her work. I had to explain the same things as before and show her in My Computer how things were set up. I also had to give her a quick tutorial yet again on how to create an Adobe PDF document (I think it was my third time)." Angela, your patience is exemplary — this is why tech support people are heroes, in our opinion.

MAKE MY DAY, PC

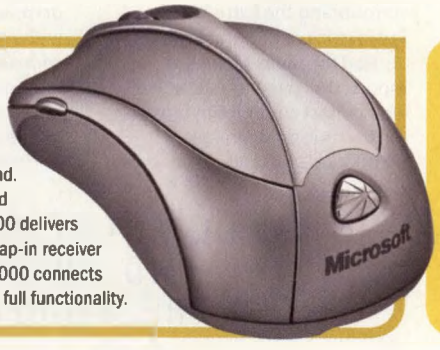
Chris Aitken, a designer and programmer from Camden, NSW, believes his story proves that tech support is one of the most stressful jobs on earth. He recalls working for a small internet provider in the late '90s, when one of the customers was a local police officer. "He was also an expert in crashing Windows 98. On one occasion, he brought his tower into the office, sat it on the counter, pulled his service pistol out of his holster and pointed it straight at the tower, threatening to shoot it. Another time he put his (by now very nervous) PC tower onto the counter, again took out his pistol, held it by the barrel and started banging the butt of the gun onto the top of the computer, quite hard too. Its no wonder techies go grey — or bald — early!" This is the first we've heard of someone trying to fix a computer by intimidating it.

DOESN'T IT JUST WORK?

Reader Ian Caldewell, a self-styled 'PC tinkerer', refurbishes PCs, and has ways of acquiring modems, monitors , CPUs, boxes and RAM — to the point where it has become a pastime consuming most of his leisure time. He now has streams of people seeking repairs, advice and assistance. "Recently, I replaced an old power supply for a couple, and, when they came to collect, they asked whether I made house calls. I said I could and asked what they needed." The lady told Caldewell she'd bought a new wireless mouse, and, since it was the last one on display, it didn't come with a box or instructions. "I asked her: 'Did you put batteries in it?'" She hadn't, of course. EOF

WINNERS!

This month's published End User writers win a Microsoft Wireless Notebook Laser Mouse 6000 worth $99.95. The first laser mouse from Microsoft designed for notebook PCs puts ultimate performance in the palm of your hand. With new, proprietary high-definition laser precision, an ergonomic design and smart navigation features, the Microsoft Wireless Notebook Laser Mouse 6000 delivers more comfort and control than laptop touch pads and toggles. Featuring a snap-in receiver for easy storing and longer battery life, the Wireless Notebook Laser Mouse 6000 connects directly to a USB port. IntelliPoint mouse software (included) is necessary for full functionality.



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Send in your tales of woe involving dumb end users or incompetent techies to ***apcenduser@acpmagazines.com.au*** and if we print it, you'll win a prize. You must supply contact details in order for us to verify your contribution.

Out of control

Joysticks: one reader was dissatisfied with Logitech's quality assurance, but what's a fair go in this situation?

What constitutes a reasonable amount of time for a product to last? And how long should warranties protect? Watchdog investigates. . .

As a regular online gamer, I use a game controller (or joystick) on an almost daily basis. My 'weapon of choice' for the past four years has been the Logitech Extreme 3D Pro, featuring 12 buttons, throttle, yaw-axis control and hat switch. Unfortunately, although I am otherwise completely satisfied with the ergonomics and performance of this unit, I now consider that its durability leaves a great deal to be desired. This opinion has been formed by the following:

1. I originally purchased an Extreme 3D Pro from Harvey Norman on 28 September 2003. This was returned with a faulty yaw control, which failed to calibrate, and replaced under warranty 15 July 2004.

2. The replacement unit was returned with an intermittent roll control fault and replaced on 15 January 2005.

3. The next unit was again returned with a faulty control and replaced on 28 October 2005.

4. Yet again, the next replacement unit was found faulty during the warranty period and replaced on 12 April 2006.

5. Finally, the last replacement unit actually successfully survived the warranty period but failed shortly thereafter, and a replacement was again sought from the retailer on 26 June 2007.

On this last occasion, Harvey Norman claimed that they were unable to exercise any discretion in varying the warranty beyond 12 months. Their advice was for me to contact the importer and manufacturer, which subsequently was also met with indifference.

Since I do not believe that my regular use of these units was beyond what should have been anticipated by the manufacturer, or at all abusive, it must be concluded that these products lacked sufficient quality to be considered marketable. Otherwise, I must assume that a manufacturer need only produce a product of sufficient quality to enable it to survive a warranty period, and, that it would be in manufacturers' interests to deliberately build in obsolescence for their products to fail as closely beyond the expiration of the warranty period as possible.

I do not believe that a manufacturer should be able to walk away from a responsibility to replace a product which fails on four successive attempts to survive the warranty period — especially when a subsequent failure occurs immediately after. One would have to assume that this manufacturer must have little regard for the satisfaction of their end users or for their reputation as a provider of quality products.

Marcus Philips
Dover Heights, NSW

Watchdog contacted Logitech and asked the company to look into Marcus' complaints. We received the following response:

Dear Watchdog,

Thankyou for the opportunity to respond to this issue. We are sorry to hear Mr Philips has experienced problems with his Logitech product. While our products go through the most stringent of QA procedures, unfortunately no such process is guaranteed to be 100% accurate. We have checked with our worldwide support team, and there are no known issues surrounding the Extreme 3D Pro joystick or its durability.

Had the faults Mr Philips reported all been the same, we would most certainly investigate further, but, as Mr Philips mentioned, the faults experienced were all different. While Logitech can most certainly understand Mr Philips' frustration, I must emphasise that we, at Logitech, regard our customers' experiences to be of utmost importance. This is apparent in our warranty process, which provides for a replacement product, rather than a repair, with the warranty starting over again upon replacement.

Logitech's worldwide warranty policy on this product is 12 months. Unfortunately, as Mr Philips' final unit failed outside this period, we are unable to assist, as doing so would contravene our corporate policy.

Line Andersen
Marketing Manager
Logitech Australia

Marcus was not satisfied by Logitech's explanation, telling us: "While I appreciate Logitech's provision of a replacement product on each occasion of the product's failure within the warranty period, my complaint is not only with these individual failures. My complaint is also with the apparent systemic failure of Logitech's QA procedures and with the seemingly inflexible response to my efforts to seek a satisfactory outcome. A product failing on four successive occasions, each time within the one-year warranty period, and then yet again subsequently within 14 months, is hardly a hallmark of a company with 'most stringent' QA procedures. This represents an 80% failure rate within 12 months, and 100% within 14 months, which I would have thought appalling from any reputable manufacturer."

Watchdog's take: *while we're sympathetic to Marcus' overall point — that products should be built to consistently survive their entire warranty period (and hopefully for a significant amount of time after) — we can't help but feel that Logitech's warranty policy was pretty fair in these circumstances. While the survival rate of these controllers wasn't high, Logitech's successive 12-month policy did see Marcus through nearly four years of gaming: the tech may have failed, but the warranty did its job.*

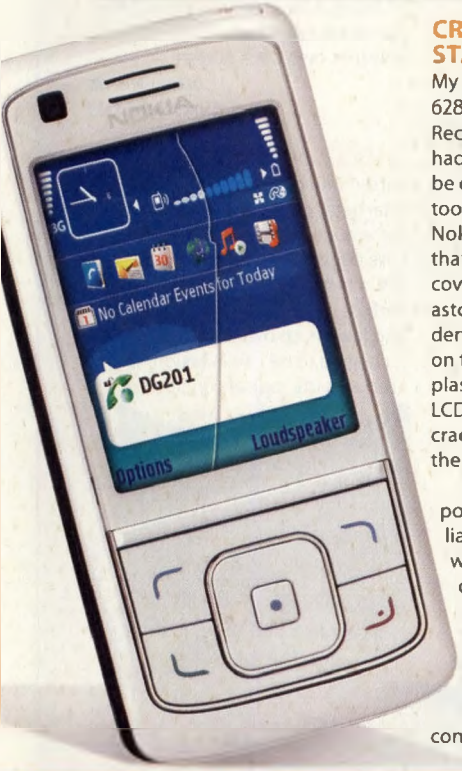
I DO NOT BELIEVE MY USE OF THE UNITS WAS BEYOND WHAT SHOULD HAVE BEEN ANTICIPATED BY THE MANUFACTURER OR AT ALL ABUSIVE

THE SLOWEST CORE 2 IN THE WORLD?

John Finlay of Moore Park Beach, Queensland, wrote into Watchdog after experiencing difficulties with his Dell Core 2 desktop. All up, John's system had cost him $4,368, but when he ran the computer, everything was very slow: "Opening or closing a file or folder often took over a minute, sometimes about five minutes. Using the computer resulted in the frustration of long periods of staring at the Vista rotating circle, with the message 'software not responding'."

John rang Dell phone support a number of times about the problem. The last gentleman he spoke to assured him that software problems were not Dell's responsibility but that he would try to help: "He talked me through the process of reinstalling Vista. Following the instructions of someone whose English I could not always understand was rather stressful. The problem was not fixed. Since then I have tried to contact Dell support three times through their web site, without any response. My feeling is that any company should check a computer system to make sure it is running well before selling it. My only option left is to employ a private consultant to try to fix the system."

Watchdog passed John's concerns onto Dell and were told by a Dell spokesperson that they'd look into the matter and that there'd be no need for John to go to the expense of getting the machine looked at privately. However, in the interim, John, as he told us later, had "given up any hope of getting Dell to help. . . and had taken the computer to a local technician who reinstalled Vista and removed McAfee security. This improved the computer markedly." John confirmed that Dell later contacted him, offering a cordless networking router in compensation for his problems. He thanked Watchdog for investigating, remarking: "Dell reacted much more positively to your email than to my many attempts to contact them." He considered the service fee money "well spent, considering the headaches the computer caused me."



CRACKS STARTING TO SHOW

My brother purchased a Nokia 6288 from 3 early this year. Recently, he found the LCD screen had cracked. Assuming it would be covered under warranty, we took the phone into the Melbourne Nokia Care Centre, only to be told that any 'Physical Damage' is not covered by warranty. We were astonished. The phone has no dents, chips or cracks anywhere on the outer cover, including the plastic screen which overlays the LCD. The only damage is a thin crack running parallel through the middle of the LCD itself.

Nokia seems to have positioned itself to avoid any liability for physical damage, whether caused by the consumer or a fault in the phone itself. Surely physical damage caused by the design or production of a phone should be covered under warranty and not left to be borne by the consumer? I find it amazing that, in the seven days since this issue has been raised and escalated, not one manager from Nokia has been available when I called, or had time to return my calls — perhaps they are dealing with more pertinent issues with the latest phones to be released.

Matt Campbell
Seaholme, Vic

Nokia provided us with the following response in relation to Matt's problems:

Dear Watchdog,

This is certainly a case where we could have done better. Judging by your reader's comments and his overview of the attempts he has made to contact us, he has been given the runaround. It must have been very frustrating. We should have been much more responsive, and for this we sincerely apologise. It is not typical and should not have happened. We will have one of our senior care managers contact your reader, apologise in person and deal with his issue. As a general rule, if screen cracking or any other issue is caused by a manufacturing fault — and not another external fault or due to physical damage or abuse — we will, of course, fix it or replace it under warranty.

We will take the lessons we have learnt from this customer's experience and try to improve our services for all our customers.

Louise Ingram
Communications Manager
Nokia Australia

We contacted Matt and asked him if Nokia's explanation was satisfactory. Matt confirmed that Nokia had been in touch and offered to replace the handset. He commented: "It is unfortunate that it takes external pressure from the media for large companies like Nokia to meet their liabilities. I can only hope that Nokia learns from this event and are able to train staff who inspect handsets to distinguish between 'customer physical damage' and 'fault physical damage'."

watchdog@acpmagazines.com.au

Has an IT vendor or telco stuffed you around? Let us know about it and we'll chase them for a solution on your behalf. Letters sent to watchdog@acpmagazines.com.au must include the writer's full name, street address, suburb, state and phone number to be considered for print publication (please also include details such as invoice numbers and people you've spoken to). Address and phone details will not be published. All correspondence becomes the property of *APC* and is subject to editing.

Bin it instead of fixing it

In today's consumer society, it's easier and cheaper to just throw things out when they don't work any more — but at what cost?

Some time ago I went to get my family's printer fixed at our local computer repair shop. The owner said it was not worth fixing, so he will bin it — he didn't want to recycle it. Why, at this stage of advanced technology and environmental crisis, don't we fix things? I know it can be expensive to fix things, but it is silly just throwing it away instead.

Justin Bussell
Piccadilly, SA

Jim'll fix it... or maybe we'll just buy a new one instead?

COMPUTER RESUSCITATOR

Brad Coates' letter of October 2007 certainly relates to me. For about two years now I've been a keen picker-upper of computers from council cleanups. I have, purely from these, been able to upgrade my kids' computers from a P1 133MHz PC running Windows 95, to a Celeron 1.4 running XP (256MB RAM, 20GB HDD) and to a P4 1.7MHz running XP Pro (same RAM and HDD). All that was needed to get the Celeron up and running was a quick cleanup using AVG Free, AdAware and Spybot. The P4 did require a reinstall of the OS, but that only took an hour or so.

I know these machines are hardly cutting edge, but they can watch video over the network, play some older games and easily complete any homework research or Office-type tasks. They also have the free K9 Web Protection software installed to help guard against any internet nasties. Due to the 'no risk' habit of pulling apart these old boxes, it really is a great way to learn about the innards of computers and how they work. I have yet to break anything, and it has given me enough confidence to know that my next computer will be one I can build myself!

Mark Willard
Minto, NSW

BRING BACK AUTOPATCHER

As a person who maintains several computers for friends, family and work, any tool which helps me do the job faster and more efficiently always helps. One of these tools, Autopatcher, was an invaluable asset. This program allows one to install Windows updates, along with Flash, Shockwave, Java and many other tweaks and tools, without needing to be online, and it has saved me many hours of downloading updates and at least 20GB of bandwidth. Now, out of the blue, Microsoft issued a take-down notice to the creators of Autopatcher, leaving many system admins, including myself, high and dry. Microsoft wants everyone to keep their PCs up-to-date, but the long task of doing so using Microsoft Update makes a computer an instant e-target before major updates are even downloaded. Autopatcher did the job faster, more efficiently, and safe from online attack. I'll say this to Microsoft, before you shut down something which fills the need for offline updates, be sure you know what you're doing to your users. Now, if you excuse me, I'll be installing Linux. At least it's putting the needs of end users first, not lining its own back pocket.

James Harris
Sinkstone, Qld

MICROSOFT AGAIN

I often find dead ends on the internet. Companies like Microsoft are amongst the worst. A recent case I discovered also involved *APC*. I installed the Expression Web demo from your May issue and liked it, so decided to buy it. It claimed to be a full version, so I came to the logical conclusion

letter of the month

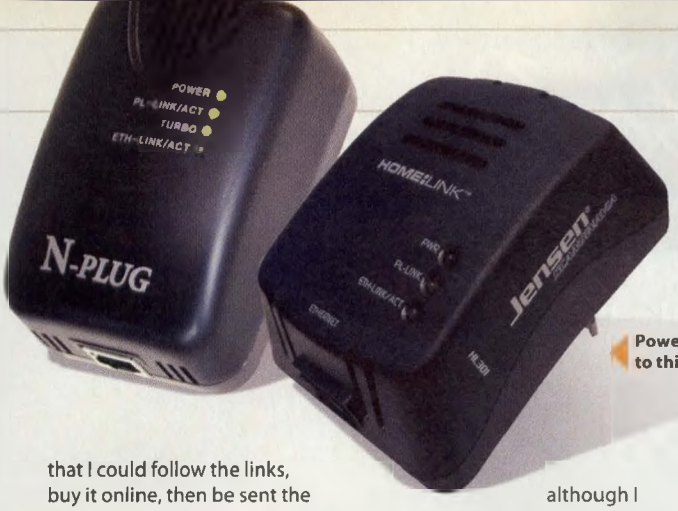
SCHOOL FILTERING

Several readers have recently expressed their opinion on the school filtering system, especially the new portal system implemented in NSW schools. Much of this opinion fails to address the real problem — the impact on students. As a Year 11 Software Design student from NSW, it is almost impossible to search for software code online, as most is posted in forums, which the filter classifies as "Business/ Technical Forums" and blocks them. In the end I gave up on the project and worked on it at home.

While I understand those that are in favour of the system, as it protects children from malicious web sites and prevents them from playing games, I find a funny contradiction — all through school we are taught to be more responsible and mature. In Year 11, we take up responsibilities around the school as senior students, and yet we are deemed too immature to read forums! Also, surely at 16 and 17, when we are entrusted to drive on the road, we aren't allowed to manage our own email?! I feel the best option is to have a filter where, as we grow older, the filter system becomes less restrictive. This way, younger children are protected when using the web, while older students are not inconvenienced when trying to do schoolwork.

Cheng Zhe Wu
Armidale, NSW

Cheng wins this issue's Letter of the Month prize, a Logitech Cordless Desktop MX 3200 Laser keyboard and mouse set valued at $199.95.



Powerline problems — there's more to this story than meets the eye...

that I could follow the links, buy it online, then be sent the registration info. It is not that easy — oh no it ain't! The links provided whet the appetite. The price is acceptable (US$299), but there is no way to buy it online. The links are a haystack. I just can't believe someone would bother setting up demos via your magazine without a purchase process. BTW, the local price is ridiculous (AU$489). Is it really worth another hundred bucks (assuming exchange rates) to buy the product from a retailer who doesn't even know what the product is? Perhaps 'Dead Ends' could be a great new column.

Murray Tinker
Yeppoon, Qld

VISTA'S GOOD

I'm really surprised at all the negative comments Vista has been getting. Despite all advice to the contrary, I installed Vista as an upgrade (rather than a clean install). In preparation, all available Vista updates for my software were installed. Installation completed without a hitch. I did not upgrade any hardware. My system is a Pentium 4, with 3GHz Intel processor (not dual) with 2GB RAM. The system is about two years old, and XP has not been reinstalled since its initial installation in 2001.

The first thing I noticed was that my boot time was noticeably quicker, as were my startup items — I was able to commence work more quickly than with XP. Generally, my system was operating more smoothly. Perhaps I was lucky, but I had no problems getting Vista updates for the remainder of my software, although I had to wait a couple of weeks before a Vista graphics driver was available. During that time, I had no issues using the XP graphics driver.

Interestingly, applications that did not work were my burning software:namely, Nero (latest version) and Roxio 9. Nero had the Vista patch applied before installation and Roxio 9 claimed to be already Vista-compliant. I uninstalled both (had to jump through hoops to remove Roxio), reinstalled both and no issues thereafter.

User Account Control. As much as it can be an annoyance sometimes, I think no magazine should recommend that people turn this off. Three times now, I have been warned of downloads and access to my system for cases where I did not initiate that download. It's a great feature, especially where others (kids) use the computer. They now need to ask me before a download can proceed as they're presented with a dialog box asking for a password.

On a finishing note, I think many people cannot be bothered looking for updates (they are not that hard to find), magazines seem to be happier printing negative feedback and I find it unbelievable that so many software companies missed the whole Vista thing given the length of time that Vista ran in beta. It's just too easy to simply blame Microsoft. One thing I do agree on, though, is that the shelf price of the software is too expensive.

Tim Pate
Glen Waverley, Vic

POWERLINE NETWORKING

There are many concerns about the use of Phone Plug and similar devices, described in *APC* June 2007 (page 90). First of all, it is quite untrue to state that the frequency range used of 4MHz-21MHz is "unlicensed". As one of the 15,000 licensed radio amateurs in Australia who has had to labour through technical, regulation and licensing exams in order to gain a licence, that equipment is now being sold over the counter that interferes with our internationally allocated frequencies. The ACMA web site makes available files of several hundred protesters against the introduction of powerline networking/BPL, including air safety, telecommunications companies, emergency services, broadcasters and others. The proliferation of devices emitting radiation in bands used by these services is nothing less than a disaster. In suburban areas, the background interference noise levels are increasing to the extent that listeners to overseas shortwave radio stations are finding it almost impossible to continue. Just as these devices transmit radiation, they also receive it. If I use my licensed 400W transmitter and users of Phone Plug or similar devices nearby are trying to transfer files or work on important documents at the time, it is most likely that their communications would be destroyed. It is regrettable that the article did not spell out these considerations. Caveat Emptor!

Morrison Hoyle
Blackburn, Vic

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GIGABYTE

This month in Labs. . .

RAM abounds

A question we get over and over again here in the Labs is about the amount of RAM for a new PC. Is two gig enough; would 4GB be better? How does 64-bit fit in, and is it a good idea? Now, to lighten the load on my email inbox, I'll give you the low-down on memory in the modern PC.

The vast majority of people run 32-bit operating systems, purely for the convenience — you don't need to hunt down 64-bit drivers, which are usually behind the 8-ball as far as features go (and often unstable). This limits the amount of memory that the PC can access to 4GB of RAM. The recommendation is to stick with 3GB or less. This is because large chunks of memory in the 3GB to 4GB section are reserved for memory-mapping devices, and, scarily, this also includes the 128MB to 1GB of memory installed in your graphics card. If you run with a 256MB card, then 256MB of the memory between 3GB and 4GB will be unavailable for your use, ie. you'll only see 3.75GB of usable memory. For those with less than 4GB of RAM, it's not eating into that memory, as these devices are mapped: it's virtual address space — your PC thinks it's there but it isn't really, until you actually put that much RAM in. Confused yet?

Now, moving to a 64-bit OS doesn't change that one bit. You'll get roughly the same amount of available RAM using 4GB of memory under 64-bit as under 32-bit operating systems — no advantage there. However, 64-bit allows you to go further than 4GB, so you can start ramping it up again. The price of 2GB memory modules and the support of the motherboard to cater to larger RAM sizes notwithstanding.

Looking forward, it'll be one of those facts we take for granted, as history shows these memory maps don't get removed: we just move on past them. So, in a few years time, you'll be installing 8GB of RAM with your 1GB video card and you'll only get 7GB to actually use.

As a rule of thumb, I recommend 2GB or 3GB for those building a PC. Seeing as 32-bit Vista will limit you to 3.12GB of memory anyway (**http://support.microsoft.com/kb/929605**), you won't feel ripped off, and it'll save a bit of money on memory that you can't use. And for those going 64-bit, good luck! APC

VIRTUAL ADDRESS SPACE: YOUR PC THINKS IT'S THERE (BUT IT ISN'T UNTIL YOU PUT THE RAM IN). CONFUSED YET?

NICK RACE – TECHNICAL EDITOR

MINI-MOUSE

There's a nice bit of inventiveness with this mini Mobile Memory Mouse 8000, where the USB wireless transceiver also doubles as a 1GB memory key. You can also toggle between Bluetooth and 2.4GHz wireless in case of signal problems. The design's not too bad for a small mouse – no carpal tunnel complaints from us. Price: $149.95.
www.microsoft.com.au

BLOGGER'S FRIEND

Microsoft's has a new 2.0-megapixel webcam called the LifeCam VX-7000, which also provides 7.6-megapixel photos and lets you use the new Windows Live Messenger Photo Swap feature. A noise-cancelling microphone also means those YouTube karaoke efforts and video blogs will sound better than ever. Price: $149.95.
www.microsoft.com.au

DUAL-WAN WIRELESS GATEWAY

Billion has launched the BiGuard 50G, a $579 standalone security gateway device that provides small businesses with a secure wireless network backed up by failsafe dual Wide Area Network (WAN) links. The BiGuard 50's built-in 802.11g provides the wireless network and always-on internet access through two WAN connections, with an automatic fail-over feature that swaps to the second connection if the first one is disrupted. Available from October.
www.billion.com.au

Expression Studio

Expression Studio is the biggest salvo fired against Adobe yet, but it delivers a surprise.

There's no doubt that Microsoft has been eyeing the alluring design and content market for some time now. *APC* looked at the first of the Expression group in April when we reviewed Expression Web (*APC* April, page 29). The full Expression Studio has now finally debuted.

All the while, talk of Silverlight as a rich-media framework sounded as if Microsoft was finally going after Adobe's creation and content crown. In truth, Expression Studio and its range of tools are poles apart from Adobe's CS3, with the key difference resting on what Silverlight is and how it can be deployed.

When we reviewed Expression Web, we found it was a proficient and professional HTML editor. It borrows heavily from Dreamweaver, with one major difference — support for ASP and .NET. This is where the key difference between Microsoft and Adobe lies.

But if Web is where Microsoft hopes you'll put all your Studio-created content on show, Expression Design is where you'll produce much of it.

As with Web, Design owes much to its direct competitor, Illustrator. Again, though, there's one key difference: no CMYK support, meaning Design is built from the ground up with the web in mind. There's also no support for SVG or Illustrator files, but as a bitmap and vector editor capable of supporting layers and non-destructive effects, Design is a fine product, if a little niggling for those schooled in Adobe's products.

Blend is the application over which most of the fuss has been made. But it's not the Flash-killer reported, nor is it meant to be: blend is an authoring environment, like Flash, based on timeline and event-specific actions, but built around Visual Basic and C# coding. It's incredibly intuitive and very straightforward. It supports 3D better than Flash, but, even though you can easily create standalone applications within it, they lack the quality and refinement of Adobe's Apollo and Flash frameworks. That said, Blend integrates to Expression Web with sublime.

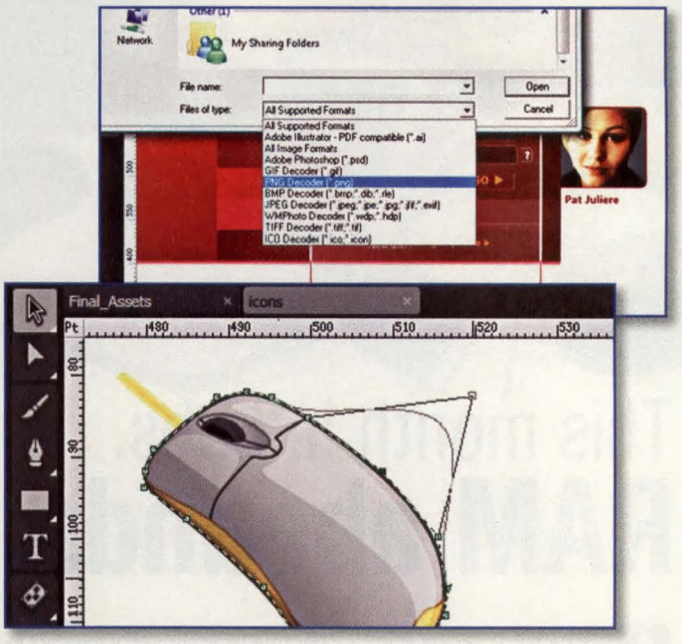
Rounding off the Studio is Expression Media, Microsoft's attempt to ape Adobe's Bridge. In fact, disregarding the UI, it's almost identical to Bridge, offering RAW, video and sound support, as well as providing the user with previews of all its native formats. Adding metadata tags is easy, with the data saved to the file itself, but you will have to import all files into a central catalogue — a bit of a restriction for those working across a network.

It should be clear by now that Expression Studio isn't the Creative Suite 3 rival some had hoped for. In truth, Microsoft has produced a rich-media authoring environment for developers, for people who are familiar with and working in ASP, .NET, Ruby or Python, and who need to dip in and out of a bitmap and HTML editor. Similarly, Blend functions as an authoring environment for those used to code but who wish to add Flash's whizzes and pops without losing sight of what the end development goal is.

This all makes sense when taking Silverlight into account. It's a framework, like Flash, which handles HD video content, uses a mark-up that can be spidered more easily, and is supposedly far easier to build applications around. Tie this to the fact Microsoft is offering the code to its own video distribution network and to MS Messenger, and we can begin to see precisely where the Expression suite will come in handy.

In practice, though, Expression Studio is a design kit for developers. A sensible move from Microsoft, leaving the design to Adobe but ensuring development is looked after in its own products.

Tom Dennis



CONTACT	Microsoft
ONLINE	www.microsoft.com.au
MARKET	Everyone
PRICE	$1,140 (full); $665 (upgrade)

✔ Strong development focus.

VERDICT ★★★☆☆

✖ Somewhat lacking for classic design.

HP Photosmart C6180

What can't the HP Photosmart C6180 do?

Nowadays, $450 is a lot of money for an inkjet printer, but, as a multifunction device, this Photosmart really delivers on all fronts. At its heart, the C6180 has HP's latest-generation six-ink printer that relies on separate cartridges for each colour. The black ink is pigment-based, so you can be sure of crisp, black text, while running costs for mono printing are reasonably low at around 4c per A4 text page — closer to 3c if you buy HP's optional high-capacity black cartridge. Colour rates are less impressive though.

The A4 flatbed scanner has a 4,800dpi maximum resolution, ideal for creating mono or colour enlargements of documents or photos, either in standalone photocopier mode or via the PC. The scanning quality is sharp, with sufficiently accurate colour and contrast for photo use. Up close, the C6180 offers a PictBridge port and a multi-format card reader for direct photo printing, with the added attractions of a clear 2.4in LCD and wide-ranging, easy-to-use controls. From a distance, the printer is equally useful, thanks to network connections that include wired Ethernet and wireless 802.11g/b, which come as standard, and there's optional Bluetooth.

There's a built-in colour fax that works in standalone mode, and a 50-sheet auto document feeder that, in our tests, worked flawlessly every time.

Print speeds can be as fast as 32ppm in mono and 31ppm for colour but they slow to a more pedestrian 8ppm and 6ppm respectively in normal quality mode.

The C6180 offers excellent print quality and you get a great deal for your money.

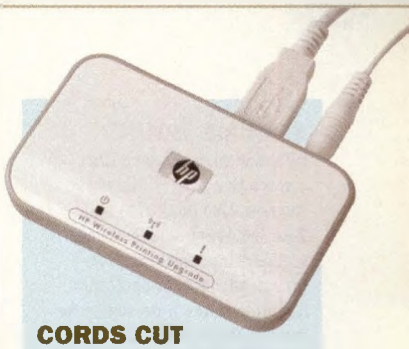
Matthew Richards

- CONTACT HP
- ONLINE www.hp.com.au
- MARKET Everyone
- PRICE $449

✔ Six single inks; Ethernet & wireless.

VERDICT ★★★★½

✖ Slow photo printing.



CORDS CUT

One less cord to untangle, and this time it's from the printer to your PC. HP's Wireless Printing Upgrade Kit includes two 802.11g receivers: one plugs into your printer and the other into your PC or notebook. The good news is it should work with non-HP printers, even though it's meant for HP printers. *www.hp.com.au*

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PRIMERA TECHNOLOGY, INC.

SPIN ME ROUND

HP's new large-screen LCDs come with a twist – literally. The new 22in (w2207h) and 24in (w2408h) screens rotate vertically into portrait mode for spreadsheets or photos, or horizontally into wide-screen for movies. These are big screens and they're HDMI-ready for Blu-ray and HD-DVD movies. ***www.hp.com.au***

QUAD-CORE DESKTOPS

Life at the bleeding edge of PCs just got faster, with HP's move into quad-core desktops. For under $2,500 you can score yourself bragging rights with the HP Pavilion a6160 home PC ($2,399). The specs are decent, including 320GB drive, and an Nvidia 8400GT, though there's only 1GB RAM. There's also a $3,699 machine. HP's pushing the machines for gamers and video editing. ***www.hp.com.au***

NOTEBOOK SOUND

Logitech has released a $149 sound system for notebooks – the Logitech AudioHub Notebook Speaker System with Integrated USB Hub – a compact 2.1 one-piece speaker system and three integrated Hi-Speed USB ports that fits behind most notebooks. The sound comes from an adjustable one-piece, three-chamber speaker system with an integrated subwoofer. ***www.logitech.com***

Nikon S50c

Nikon's S50c has Wi-Fi image transfer, but is this just a gimmick to get you to pay more?

People shopping for a point-and-click compact don't usually put Wi-Fi functionality high on their wish list, but if you're looking for a camera that can beam photos straight to Nikon's community photo site, here it is. The S50c is an updated version of the well-received S50 and offers a powerful 7.1-megapixel sensor and 3x optical zoom in a stylishly thin case. We can take or leave transferring photos at 802.11g speeds to the sharing site; how difficult is it to take a photo, open it on your PC and upload said shot to your usual photo site?

COOL CASE

A wireless gimmick aside, there is much to like about this camera. It looks great in its scratch-proof, pearlescent casing, and the generous 3in LCD makes composition a breeze. The LCD is bright too, which is a big advantage when taking shots in strong sunlight. So big is the LCD that the key controls are squeezed onto a narrow strip on the back. It can take a while to work out where to put your thumb, but an iPod-style click wheel means the camera is perfectly intuitive when it matters. More interesting are the face detection, high ISO and VR functions. The S50c is programmed to recognise faces in a composition and automatically work out the correct focus and exposure. This works well, and is handy for group shots or where people are being shot against a busy background in challenging light conditions.

As mentioned, the big LCD and shiny casing can make the camera feel slightly unwieldy at first, so it's good that Nikon has included VR image stabilisation. This may seem like overkill on a camera that only goes up to 3x optical zoom, but image stabilisation is a perennially useful feature. Nikon claims the VR system makes the camera feel faster too, and the S50c is certainly nippy if you don't shoot at maximum image quality.

CONTACT	Nikon
ONLINE	www.nikon.com.au
MARKET	Everyone
PRICE	$649

✔ 7.2 megapixel sensor; 1,600 ISO.

VERDICT ★★★★☆

✖ 3x optical zoom; 802.11g.

ANTI-SHAKE

Select anti-shake mode and the camera automatically increases its ISO; increased light sensitivity means you can shoot at a faster shutter speed, reducing the risk of camera shake. The S50c offers a maximum ISO setting of 1,600, but camera noise at this level is certainly noticeable. Further down the ISO range — below 400 — noise is well-controlled. So it's a pay off — increased risk of noise in return for flash-free flexibility — and the good news is that users of the S50c aren't excessively penalised. Indeed, this is a quite-intelligent compact, with a Best Shot Selector (BSS) that looks at 10 sequential shots and automatically selects the sharpest image. This underscores the fact that the camera is aimed at people who just want straightforward, well-exposed shots, rather than getting creative with manual controls. Indeed, apart from ISO, white balance and simple exposure adjustment, manual controls are pretty restricted.

We like this camera for its excellent build quality and ease of use, but we're not convinced that the Wi-Fi features are worth paying any extra for. The wireless-free S50 offers most of the virtues of the S50c.

The face recognition and VR technology are certainly good to have, and the quality Nikkor lens — 6.3 to 18.9mm — produces smooth, well-exposed images across the range. But this is not a camera to grow and develop with as a photographer.

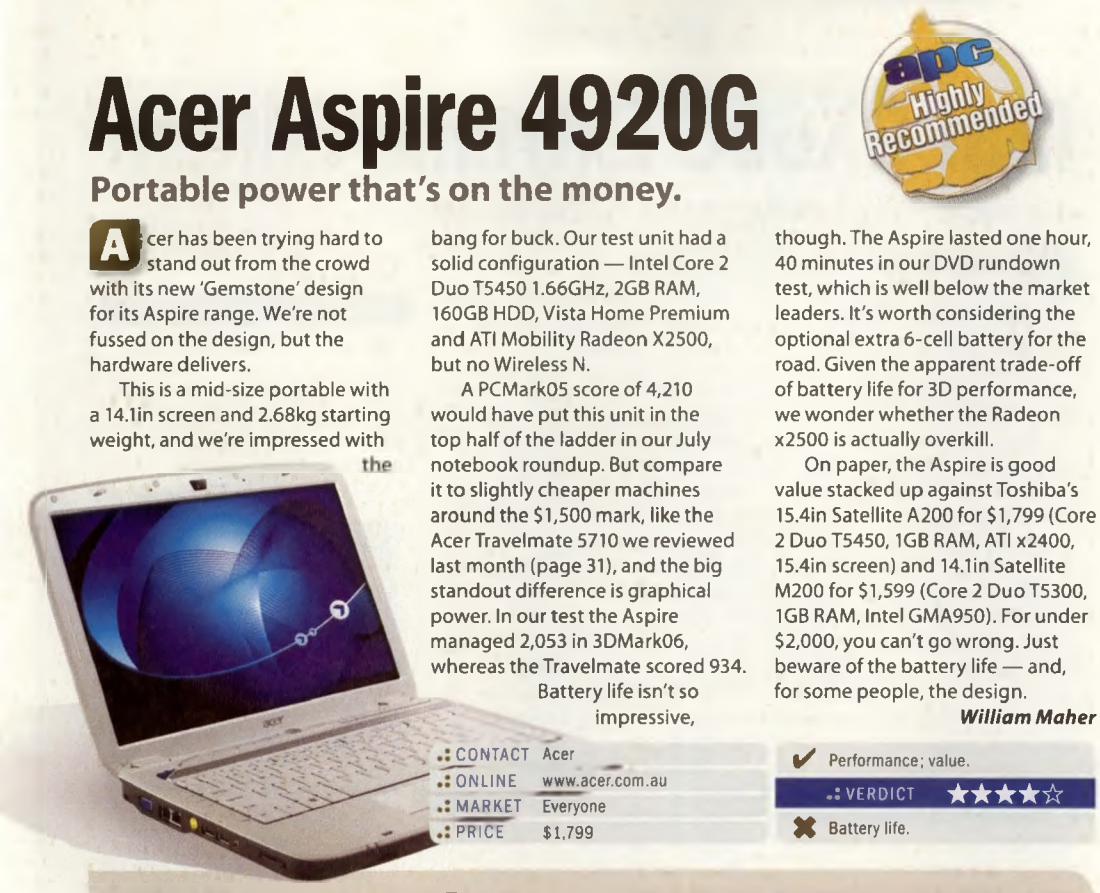
The 3x optical zoom is very limited, requiring you to move physically closer to your subject, and the lack of an optical viewfinder is not always the best compositional tool.

The limited aperture range also means you would be hard-pushed to replicate arty effects such as blurring the background in a portrait shot. This is a neat, little breast pocket or handbag-sized snapper that comes with lots of features to make it harder to mess up your photographs. And that's surely something to be applauded.

Geoff Harris

Acer Aspire 4920G

Portable power that's on the money.



Acer has been trying hard to stand out from the crowd with its new 'Gemstone' design for its Aspire range. We're not fussed on the design, but the hardware delivers.

This is a mid-size portable with a 14.1in screen and 2.68kg starting weight, and we're impressed with the bang for buck. Our test unit had a solid configuration — Intel Core 2 Duo T5450 1.66GHz, 2GB RAM, 160GB HDD, Vista Home Premium and ATI Mobility Radeon X2500, but no Wireless N.

A PCMark05 score of 4,210 would have put this unit in the top half of the ladder in our July notebook roundup. But compare it to slightly cheaper machines around the $1,500 mark, like the Acer Travelmate 5710 we reviewed last month (page 31), and the big standout difference is graphical power. In our test the Aspire managed 2,053 in 3DMark06, whereas the Travelmate scored 934.

Battery life isn't so impressive, though. The Aspire lasted one hour, 40 minutes in our DVD rundown test, which is well below the market leaders. It's worth considering the optional extra 6-cell battery for the road. Given the apparent trade-off of battery life for 3D performance, we wonder whether the Radeon x2500 is actually overkill.

On paper, the Aspire is good value stacked up against Toshiba's 15.4in Satellite A200 for $1,799 (Core 2 Duo T5450, 1GB RAM, ATI x2400, 15.4in screen) and 14.1in Satellite M200 for $1,599 (Core 2 Duo T5300, 1GB RAM, Intel GMA950). For under $2,000, you can't go wrong. Just beware of the battery life — and, for some people, the design.

William Maher

CONTACT	Acer
ONLINE	www.acer.com.au
MARKET	Everyone
PRICE	$1,799

✔ Performance; value.

VERDICT ★★★★☆

✖ Battery life.

Fujitsu LifeBook S6410H

Lighten your load.

The big battle in notebook land right now is to be the thinnest, and Fujitsu's contender is this 13.3in model with the tagline 'stylish mobility'.

This is a solid machine and it's a true portable, with a 1.66kg starting weight (our test unit was about 1.8kg) and the latest technology, including a backlit LED screen and 1GB Turbo memory.

The performance is OK, but it's no screamer, considering the price. In our PCMark05 benchtest the Fujitsu cranked out a score of 3,552. Compare this to the 13.3in Dell XPS M1330 we reviewed last month — a similarly sized unit which blitzed the Fujitsu with a PCMark score of 5,408. The Dell was more expensive at $2,899, but the performance is in a different league.

Price aside, Fujitsu has the right idea. The 6410 is small enough but isn't hobbled in raw grunt like its tiny sub-1kg cousins. Onboard is Intel Core 2 Duo T7300 2GHz, Mobile Intel 965 Express Chipset (Intel GMA X3100 graphics), 100GB HDD, though only 1GB RAM.

The Turbo Memory is unique to Intel's new Centrino lineup and utilises flash memory to save on hard drive use (by caching frequently accessed data) and to complement existing RAM (ReadyBoost). Performance and battery gains are said to vary, but it can't hurt.

Battery life of two hours, 16 minutes in our DVD rundown test didn't break any records, although keep in mind we used the standard battery. We found the system ran to roughly three and a half hours for 'normal' usage like web browsing and music — that's with the Wi-Fi on, power saver mode on and sleep settings disabled.

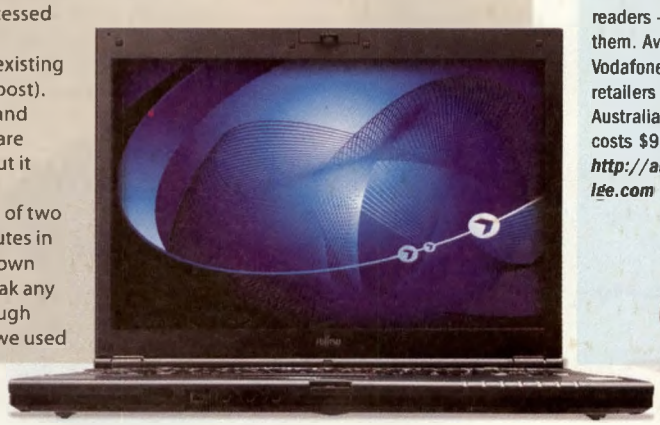
William Maher

CONTACT	Fujitsu
ONLINE	www.fujitsu.com
MARKET	Everyone
PRICE	$2,599

✔ Backlit LED screen; thin and light.

VERDICT ★★★½☆

✖ Not great bang for buck.



FIERY MFC

Not happy with taking over from standalone devices in the home office and small businesses, MFCs are encroaching into larger company offices as well. Case in point is the Lanier MPC4500e1 Fiery colour MFC. With a digital copier, printer and scanner, the MPC4500e1 Fiery is for general offices that need short runs of serious colour printing.

www.lanier.com.au

LED SCANNER

Epson has released the world's first CCD scanner to be powered with LED (Light Emitting Diode) technology which is claimed to have a far lower power consumption than other scanners. The Perfection V500 is $499.

www.epson.com.au

PHONE FASHION

We first mentioned it a few months ago, but the Prada touchscreen mobile by LG is finally available locally. Designed by LG together with the Prada luxury goods house, the KE850 is for the fashionistas among our readers – all three of them. Available from Vodafone and Optus retailers across Australia, it costs $999.

http://au.lge.com

VISTA CREATOR

Roxio has finally released the Roxio Easy Media Creator 10 Suite, the version of the multimedia creation package that's compatible with Vista. Easy Media Creator lets users turn photos, video and music into productions that can be shared on CD, DVD, the web, or mobile devices. RRP is $159.95.
www.mindscape.com.au

NEW NORTONS

Symantec has announced Norton Internet Security 2008 and Norton AntiVirus 2008, the latest versions of the widely used security suites. They now feature protection against "drive-by downloads," or downloads which happen without the user's knowledge, as well as identity theft prevention. In addition, Norton Internet Security 2008 checks the status of wireless network security. Norton AntiVirus 2008 is $49.95. Norton Internet Security 2008 is $99.95 for a three PC license.
www.symantec.com.au

VIEWSONIC

ViewSonic has launched a projector with a so-called short throw, enabling it to show a 60-inch image at a distance of 1.8m. This makes the PJ760 multimedia LCD projector ideal for apartments or small meeting rooms. It's bright too, 3,200 lumens and a native XGA 1,024 x 768 resolution and weights 3.6kg. Price: $2,599.
www.viewsonic.com.au

MSI GX600 Extreme Edition

It's back — say hello to the Turbo Button.

If you're spending up to $3,000 on a notebook you want to know it beats the pants off cheaper machines — and yes, this MSI delivers pants-busting performance. Plus it has a few tricks up its sleeve.

The 3D performance is particularly hot, beating nearly everything we've seen on the market in the last three months. It cranked out a 3DMark06 score of 3,606 thanks to Nvidia's GeForce 8600M GT with 512MB.

We grimaced a bit at the big round Turbo Button, but it seems to work. Performance jumped from good to excellent, with the best PCMark05 result we've seen from a notebook in recent memory.

The speed comes from overclocking the FSB — MSI promises up to a 20% gain in CPU speed and you can hear the fans rev up to compensate. In some sense a Turbo Button makes sense on a notebook, letting you toggle speed on and off so as to save power where necessary (though perhaps more crudely than Vista's power modes). Keep in mind that battery life isn't great, lasting only about two hours in our DVD rundown test, but it is after all a gaming system.

This isn't a cheap machine, but fortunately pure speed is not the only drawcard. You also get an HD TV Tuner and an HD-DVD drive, which is nothing to sniff at for under $3,000.

We're in two minds over the 15.4in screen size, which has a cramped keyboard. If you aren't going to be carting this around much, then the 17in model is the way to go. In short, lots of grunt, if you're OK with the battery life and the flame paint job.

William Maher

CONTACT	MSI
ONLINE	www.msicomputer.com.au
MARKET	Performance enthusiast
PRICE	$2,999

✔ Fast! HD-DVD.

VERDICT ★★★★☆

✖ Battery life; cramped keyboard.

Logitech G9 Laser Mouse

Customised fragging.

If gaming's your bag, then this is the ultimate. Logitech has been running the game for generally accessible laser mice for the frag set for a couple of years now. The latest rodent in its rodeo is the G9, though you won't fool the boss into getting this one as a "precision pointing device".

The G9 laser mouse is a tried and true piece of gaming hardware. From the interchangeable grips (Wide Load and Precision), the "DryGrip technology" for those sweaty palms and mouse buttons good for 8 million clicks, this mouse is purely for the keyboard jockeys.

Further features include an on-the-fly changeable resolution from 200dpi to 3,200dpi and a 1,000Hz USB "report", adjustable weight cartridge (with weights provided in a case, so you can change it for different games at a LAN without taking a ziplock baggie) and a 6.4MP/s image processing resolution. The scroll wheel can be set to clicky or smooth with a press of a button on the under side of the mouse, based on your preference.

The G9 also packs in a mini LED display, which shows you on the fly what speed your mouse is set at, plus the active profile you've selected in software. Though considering it's going to be under your hand when it counts, the display might be a bit of a waste. The cable is thin, light and covered in woven fabric, less likely to snag on a desktop. Logitech have thought about this one.

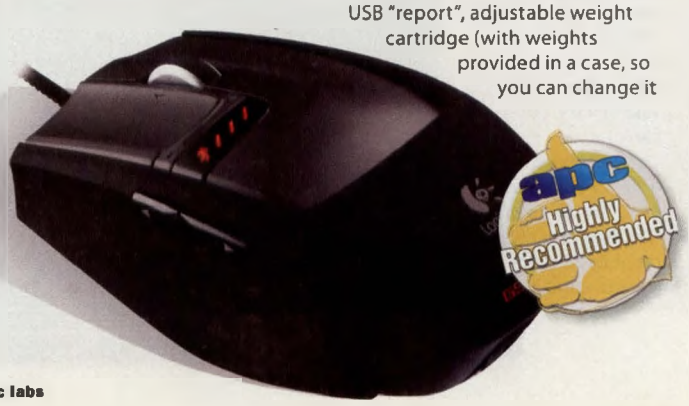
Nick Race

CONTACT	Logitech
ONLINE	www.logitech.com
MARKET	Gamers
PRICE	$169

✔ Customisable; comfortable and quick.

VERDICT ★★★★☆

✖ LED is in the wrong place.



QNAP TS-209 Pro

QNAP's two-disk NAS provides power and protection.

The TS-209 Pro uses two hot-swappable SATA drive bays, each capable of supporting the newest 1TB drives, so you can have a 2TB non-redundant striped data store, or a 1TB redundant RAID-1 mirror. The device itself is powered by a 500MHz CPU, 128MB DDR2 RAM and a single Gigabit LAN port.

As with most NAS units on the market, the devil is in the detail — specifically what services each device supports. The TS-209 is well-stocked with networking services: File, FTP, iTunes, TwonkyMedia, web, MySQL, SQLite, DDNS, Printer and Backup. It also has an onboard BitTorrent/FTP/HTTP download station, integrates with Windows Active Directory for security/permissions, supports AppleTalk, automated backup and data replication to other QNAP NAS.

There are two USB ports on the back for attaching USB printers, and one on the front for USB devices like flash drives and cameras. The TS-209 has an autocopy feature to copy all the data off USB devices onto the local disk. You do need QNAP software to initially set up the device, but once done it has an attractive and intuitive web interface. You also need client software installed to manage download tasks on multiple QNAP devices and set up automatic backups.

Read/write performance was very good, taking three minutes to copy across 3GB of assorted MP3s, videos and large executables, and just under that to copy it all back across again. There's an inbuilt Recycle Bin which catches all data deleted from the NAS (just in case), and all the multimedia contents are accessible by networked devices like the PS3 or Xbox 360.

Although pricey, it offers power users and businesses the flexibility to run their data and entertainment network effectively from one unit, with the power to keep important data protected and secure.

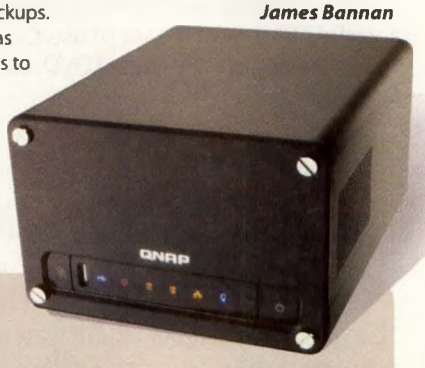
James Bannan

CONTACT	QNAP Systems Inc.
ONLINE	www.qnap.com
MARKET	SMB/Enterprise
PRICE	$599

✔ Wide feature set; powerful.

VERDICT ★★★★½

✖ Expensive.



Killer NIC

Dedicated network card to offers gamers the online edge?

Gamers are always on the lookout for hardware that will give them the extra edge in the furiously competitive world of online gaming: enter the Killer NIC from Bigfoot Networks. Designed purely for gamers, the Killer NIC is a dedicated gigabit network expansion card. It sports a 400MHz CPU, a customised version of Linux and LLR (Lag Link Reduction) technology, designed to reduce latency and improve online gaming performance. It does this by bypassing the OS-based network stack, thus freeing up CPU load. The on-card OS also utilises traffic priority algorithms to always give top priority to gaming traffic, and incorporates a stateful firewall and packet filter.

There's plenty of anecdotal evidence from gamers convinced their networking performance has increased. Our tests didn't replicate any of these results. We ran broadband speed tests and game mirror latency tests with and without the Killer NIC. Latency on the broadband tests improved fractionally by around 3ms using the Killer NIC, but game mirror latency did not improve at all. There was also no change in gaming framerates.

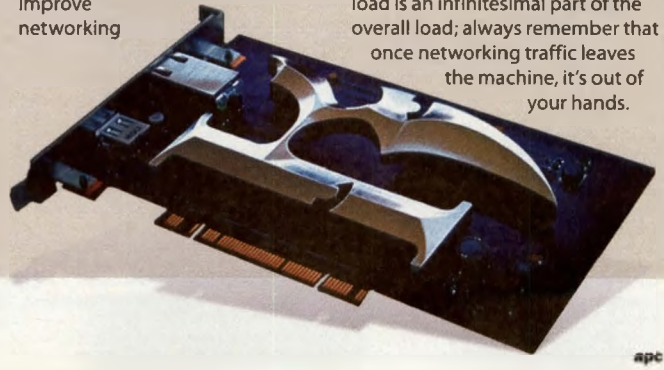
It's possible the Killer NIC will improve networking performance in some cases, but there's no definitive evidence to suggest that it offers guaranteed improvements. From a security perspective, running a separate hardware-based firewall is always a good idea, but you still have to install and run the necessary software to interact with it. Also, on high-end machines, networking load is an infinitesimal part of the overall load; always remember that once networking traffic leaves the machine, it's out of your hands.

CONTACT	Altech Computers
ONLINE	www.altech.com.au
MARKET	Performance enthusiast
PRICE	$359

✔ Powerful hardware and features.

VERDICT ★★★☆☆

✖ Performance; very expensive.



NEW PIXMA

Canon has announced a new PIXMA inkjet multifunction printer, the MX700. It comes with a high-speed automatic document feeder and Ethernet connectivity and prints up to 30 pages per minute for B&W and 20 pages per minute in colour. (RRP $299).
www.canon.com.au

PIXMA UP

Canon has upgraded other PIXMA models. The newest units, including, the PIXMA MP520 (RRP $199), PIXMA MP610 (RRP $299), and PIXMA MP970 (RRP $449), introduce automatic image fix, and a quick start feature as well as finer ink droplets as small as one picolitre (1 trillionth of a litre), for laser-like prints.
www.canon.com.au

ADOBE AUDITION 3

Not to be outdone, Adobe Systems has released Adobe Audition 3 software, an all-in-one solution for sound designers, recording and mastering engineers, and musicians. Audition 3 is a flexible production toolkit for recording, mixing, editing, and mastering audio.
www.adobe.com

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VALUED AT $199

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Corel Painter X

Offers artists and photographers professional art and design tools, providing an organic painting and illustration experience. It introduces the revolutionary RealBristle Painting System.

CorelDRAW Graphics Suite X3

VALUED AT $749

CorelDRAW Graphics Suite X3 is trusted by designers and business users to transform ideas into professional results. It offers unmatched affordability and design capabilities.

VALUED AT $199

Corel Paint Shop Pro Photo X2

With automatic and precision editing tools, plus the Express Lab to help you view and fix photos, Corel Paint Shop Pro Photo X2 is the easiest way to get professional-looking photos — fast.

Corel WordPerfect Office X3

VALUED AT $589

Corel WordPerfect Office X3 — Standard Edition includes word processing, spreadsheets, presentations and email, Microsoft Office-compatibility and powerful PDF creation and editing.

COREL

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NAVMAN S-SERIES

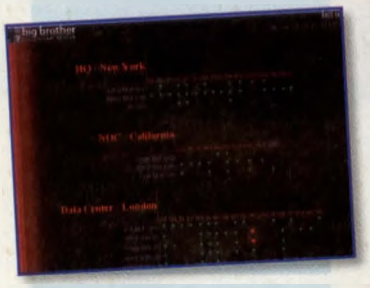
Navman's new S-Series in-car GPS navigation devices have been redesigned and upgraded. The flagship model is the $799 S90i, which is pre-loaded with speed and red light camera alerts and includes a camera, Bluetooth hands-free calling and text-to-speech capability.

www.navman.com

NEW BIG BROTHER

Big Brother Professional Edition (BBPE) started off as a simple web-based system and network monitoring solution – but Quest bought it and now keeps upgrading it. Version 3.3 introduces significant improvements to the UI and offers more centralised configuration options. Pricing based on number of site licences.

www.bb4.com



LOGIC BAND

What happens after you've created a song in Apple's GarageBand? You use Apple's new Logic Studio to record it. Logic Studio is a comprehensive suite of professional tools for musicians to create, produce and perform in the studio and on the stage. RRP $649.

www.apple.com.au

Epson Dreamio EMP-TW1000

A 'budget' projector, but the results are stunning.

The first high-definition projector to offer change from $5,000, Epson's Dreamio EMP-TW1000 can turn your lounge-room wall into a slice of high-def heaven.

Capable of displaying 1080p, the TW1000 is a 'short throw' projector, meaning it can produce a large image from a short distance, great for small lounge rooms. It's a 3LCD projector rather than DLP, meaning it doesn't suffer from the 'rainbow effect' (when you move your eyes and the image momentarily blurs into red, blue and green).

The TW1000's 1200 lumens rating is bright enough to offer a reasonable picture during the day with the curtains closed. It also offers impressive image contrast, rivalling the best LCD televisions, if perhaps not the best plasmas.

When it comes to inputs, it sports HDMI 1.3, component, 15-pin D-Sub, S-Video, composite and SCART via an adaptor.

Watching Mel Gibson's jungle epic *Apocalypto* on Blu-ray, the picture was stunning — even at eight foot across. Colours were vivid, skin tones excellent and we could get all the shadow detail with only the slightest adjustment.

So if the TW1000 is a budget 1080p projector, what's the catch? It will only project images at 50Hz or 60Hz (frames per second), the frequency of PAL and NTSC content respectively. Blu-ray and HD DVD are in 24Hz, meaning the projector converts them, which can result in a motion shudder. While more expensive projectors might project at 24Hz, or a multiple of 24, the sad truth is most Blu-ray and HD DVD players convert the signal to 50Hz or 60Hz before it even leaves the player. Our player was set to 24Hz, which the projector converted, but the picture still looked fine.

Adam Turner

CONTACT	Epson
ONLINE	www.epson.com.au
MARKET	Everyone
PRICE	$4,999

✔ True HD; big picture.

VERDICT ★★★★½

✖ Converts 24Hz to 50/60Hz.

D-Link DNS-323

This simple NAS offers great features.

The D-Link DNS-323 comes across as something of an entry-level NAS, but, in reality, it's anything but.

It's a two-disk NAS, supporting RAID-0, RAID-1, JBOD or independent disk configuration. While supporting non-redundant RAID standards (RAID 0) is really just a legacy capability of more advanced RAID, it worries us when vendors promote RAID 0 as a viable option. It isn't — lose one disk and the data is irrevocably lost. Fortunately, D-Link don't do this, and the DNS-323 will certainly keep your data safe if the disks are mirrored.

The unit itself is very compact compared with other two-disk NAS devices, and this certainly helps to conserve space. The front of the unit has status LEDs, while the back has a power port, Gigabit LAN port and a USB port for connecting and sharing a USB printer. It also has two drive eject levers, which is an interesting feature. You install the drives by lifting and removing the front cover — the drives then slide in and replacing the cover provides the mean of securing them. The only problem wth this design is that the front cover is sensitive, and moving the unit can result in it popping straight off.

Read/write performance is pretty good. We wrote 3GB of assorted MP3s, videos and executables across, which took three minutes, 30 seconds to copy across and just under three minutes to copy back.

The DNS-323 doesn't have the same range of networking services as other units on the market, but it does provide FTP, iTunes, UPnP AV and DHCP services, which is still a useful array for most home networks. It comes bundled with Memeo AutoBackup software for automating backups to the device, but it's accessible as a mapped drive or UNC path — you can always just use Windows Backup to automate data protection.

James Bannan

CONTACT	D-Link
ONLINE	www.dlink.com.au
MARKET	Performance enthusiast
PRICE	$399

✔ Very affordable RAID 1 storage.

VERDICT ★★★★☆

✖ No web features.

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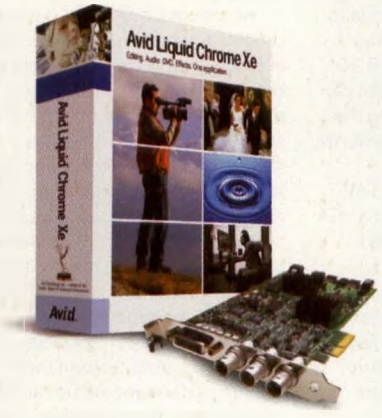

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Avid
AUSTRALIA

VIRTUAL BACKUP

The first application to enable IT managers to back up and restore both physical and virtual servers has been announced by Acronis, the storage management and disaster recovery software maker. True Image Echo integrates with all Windows- and Linux-based servers, regardless of whether those servers are physical or virtual, and supports virtualisation operating systems such as VMware, Microsoft, XenSource, SWsoft and Parallels. It's currently in beta and should be available early next year.

www.acronis.com

IT'S BIG STORAGE

For those in need of serious storage for their PC or workstation, LaCie has released the aptly name Biggest Quadra, a $3,559 four-disk RAID solution with four terabytes of storage and interfaces galore, including USB 2.0, FireWire 400, FireWire 800 and eSATA.

www.lacie.com/au/index.htm

IPOD TOUCH

Apple has introduced the new iPod touch, which has Apple's iPhone-style no-keys user interface. It helps make the iPod touch just 8mm thick.

RRP is $419

www.apple.com.au

The R2Hv's passive digitiser means you can use your fingers as well as a stylus.

ASUS R2Hv

Some impressive features, but the UMPC is still a WIMP.

CONTACT	Organiser World
ONLINE	www.ow.com.au
MARKET	Everyone
PRICE	$1,899

✔ Lots of accessories; GPS.

VERDICT ★★★☆☆

✖ Poor battery life; slow.

On paper, the ASUS R2Hv ultra-mobile PC is impressively good value. It packs a 1GHz Intel Pentium M 723 ULV chip (powerful by UMPC standards), 1.25GB of RAM, 80GB hard drive, Windows Vista Business and built-in webcam, GPS and fingerprint reader — all within a relatively portable 830g frame. A wealth of accessories is also supplied, including an external DVD burner, foldable USB keyboard, car charger and cable for syncing data with another PC.

Unlike many Tablet PCs, the R2Hv uses a passive digitiser, so you can use your fingers on the 7in touchscreen in addition to the supplied stylus. Most applications play happily with the device's 800 x 480 native resolution, but even within Vista you'll find a few dialog boxes that assume a minimum screen height of 600 pixels. This is where the R2Hv's dedicated Settings button comes in handy, which launches a utility for changing resolution (800 x 600 and 1,024 x 600 are offered in interpolated mode) and selecting different Power profiles.

But there are still a few display-related quirks. The R2Hv frequently resumes from standby or reboot at the wrong resolution, which means you'll need to use the side-mounted track pointer and mouse buttons to log in. A bigger concern, though, is the flaky touchscreen, which intermittently stops registering screen taps until the device is rebooted. Both appear to be software problems, so hopefully these are fixed in a future update.

As a notebook replacement, the R2Hv does a decent job, especially with the bundled keyboard and mouse. It comes with two USB 2.0 ports (and a mini-USB port that can be converted to full USB using the supplied adapter), 802.11b/g WLAN, Bluetooth 2.0, Ethernet, microphone, headphone and AV-out ports, an SD card slot and a VGA port (using a bundled adapter).

The built-in SirfStar III GPS chipset sets the R2Hv apart from other UMPCs — and laptops for that matter — but it seems more like an afterthought than a core feature. Information on configuring the GPS is scarce in the supplied documentation, mapping software isn't provided, and even after loading CoPilot 10, we weren't able to get it to find the GPS receiver.

If you compare the R2Hv's price tag to ultraportable notebooks in the same weight class, it comes out ahead by at least a thousand dollars, which is great if your top priorities are value for money and mobility. Performance and battery life, on the other hand, are a let-down. Put plainly, the R2Hv simply doesn't have enough power to satisfy the resource-hungry Windows Vista, and we spent more time gazing at Vista's spinning green wait symbol than actually using the device.

Notebooks with a low-powered processor tend to have longer-than-average battery life to compensate, but in this respect the R2Hv gets the worst of both worlds. With the screen dimmed and the battery-saving mode active, the skimpy two-cell 3,860mAh battery struggles to reach the 1.5-hour mark. Given the target demographic is BlackBerry-toting highly-mobile road warriors (where the ability to last a full work day is paramount), this shortcoming is less forgivable than the crippled performance.

The performance issue can be minimised by upgrading the R2Hv's RAM to 2GB, and battery life can be improved by purchasing the four-cell extended battery, but when you've spent that much it's worth considering whether an ultraportable laptop wouldn't better address your needs.

Still, if you insist on going the UMPC route, the R2Hv is one of the better options, as most of the other devices cost more and still use the slower 900MHz Intel Celeron chip.

Jenneth Orantia

SONY

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Making your own movies is easy and fun with Sony video editing and DVD creation software. With Vegas Movie Studio Platinum Edition software you can import and edit almost any type of video, including HDV and Sony AVCHD. Simply drag and drop to create movies and slideshows with effects, transitions, and music. Share your videos online or anywhere - DVD Architect Studio software is included so for easy DVD authoring and burning. What are you waiting for?

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Vegas Movie Studio Platinum Edition
November 2006

TOP BUY PC USER

IPOD CASES

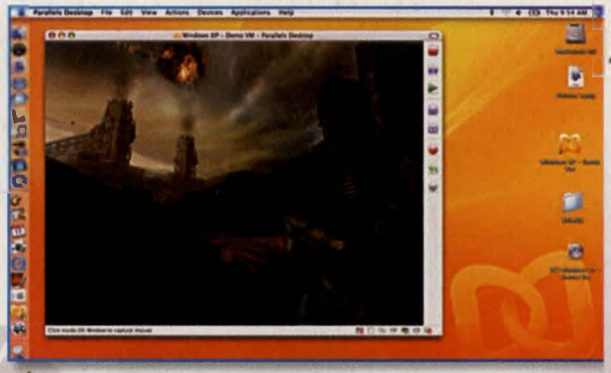
Quick on the heels of Apple's release of the iPod touch (and iPod nano and classic) Belkin has announced new iPod cases. Pictured is one of the new $39.95 armband cases (available for the nano, classic and touch).
www.belkin.com/au/

EPSON CENTENARIAN

We love claims about printer inks lasting several decades. We can imagine a 120-year old *APC* Technical Editor Nick Race verifying that the new inkjet MFCs from Epson, the Stylus CX8300 ($199) and Stylus CX7300 ($149), and a new printer, the Sylus C90 ($79), do create photos that last 120 years, as claimed. The "resin coated pigment ink" they use is water and smudge resistant, which is just as well, because the world will be a wetter and warmer place by then.
www.epson.com.au

CANON SCANNER

Despite being increasingly swallowed up by MFCs, scanners still exist in standalone form and are increasingly sophisticated. Canon's $349 CanonScan 8800F features a high-speed book scanning function, 4,800 x 9,600dpi optical resolution with 48-bit depth, and automatic dust and scratch, fading, graininess and backlight correction technology.
www.canon.com.au



Parallels Desktop 3.0 now offers 3D graphics support for PC games.

Run Windows* Alongside Mac OS X
Parallels® Desktop 3.0 for Mac
"It's like having two computers in one, the best of both worlds."
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Migrate your existing PC to your Mac
Fast! Works on any Intel-based Mac
Mac
Parallels Desktop 3.0 for Mac

Parallels Desktop 3.0

apc Editor's Choice

A virtual machines approach seamlessly mixes OS X and Windows to great effect.

CONTACT	Parallels
ONLINE	www.parallels.com
MARKET	Everyone
PRICE	$129.95

✔ Windows integration into Mac OS X.

VERDICT ★★★★½

✖ Still a little sluggish.

Convergence has been a popular buzzword in recent times. As mobile phones swallowed cameras and applications like Photoshop-integrated tools which let them do the job of other specialised programs, it really looks like computing could be heading towards a single definite point.

Although it's only the second or third step along a long, long road, Parallels Desktop is quite a stride towards the convergence of OSs. In previous versions it was simply a virtual machine for OS X. But the recent addition of Coherence mode takes the program to a whole new level. Not only does Parallels Desktop allow you to run Windows on top of OS X, it makes the join between OS and VM all but seamless. While you're still essentially running a VM in the background, in Coherence mode your XP or Vista programs and Start menu are brought right into OS X, so you can run Windows software without changing environments.

And it's brilliant. It really works. Windows-only applications (we tested music suite Fruityloops among others) appear in all-but flawless windows of their own; draggable, resizeable and functional even if they don't currently have focus. Parallels doesn't re-skin them, so it's easy to recognise Windows apps among those of OS X, and we were pleased to find the program working with Vista's Aero skin — though not Aero Glass — perfectly.

There's still some way to go for other operating systems. It supports Linux happily (we installed SUSE 10.2) but it doesn't yet integrate it with OS X in the same manner. You can switch between the two if you like — they just can't converge.

Essentially, the technology behind Coherence is rather basic; it just cuts around the edges of Windows and pastes them over the top of OS X, as is evidenced by occasional glimpses of our XP background. There's a shared copy/paste buffer for seamlessly transferring information between the two operating systems, and Parallel's existing technology allows the drive of the VM to be read as if it were a network-attached machine, but such a simple concept allows an almost seamless join between the two, and opens our eyes to the possibilities of the future. Somewhere along the line we will have operating systems that encourage VM use, and virtual machines that chat away happily to your OS, no matter what it is. Running a system based on Linux will be no barrier to a seamless Windows experience, and vice versa.

It's hard to argue with Parallels' might. It's the leading VM on OS X by a long shot, and the features just keep rolling in. Perhaps the most significant new feature is 3D graphics support, which would theoretically let you play your Windows games under virtualisation. We say theoretically, because tests on our review Mac (a 1.8GHz Core 2 Duo iMac with 1.5GB RAM) showed a distinct lack of 3D performance compared to Boot Camp XP. That said, you'll be able to play older games pretty easily.

A new Coherence mode feature called SmartSelect associates Windows files with Windows applications, and vice versa. Double-click a Word doc, for example, and it will automatically open with the Windows version of MS Word. Parallels Explorer, another new mode, lets you browse your Windows VM as if it was an OS X drive. The lines are being blurred to such an extent that it doesn't feel like you're using a VM; just a slightly sluggish Windows system. With a heavyweight processor and plenty of RAM, you'll be in mixed-OS heaven.

Alex Cox

GuardedID 1.02

Taking care of keyloggers in Internet Explorer

A planted keylogger is the stuff of nightmares. It's bad enough if it steals your email password but, if it's a client number and password for online banking, things can get very scary. From online shopping to bill payment, keyloggers have ample opportunity to pinch valuable information.

To address this problem, StrikeForce Technologies has created GuardedID. This program integrates itself into Internet Explorer, it appears as a toolbar, and encrypts keystrokes as you type them. It colours text fields in green and calls it "CryptoColor".

This utility works by bypassing standard Windows communication paths that keyloggers exploit. Instead it reroutes encrypted keystrokes via its own channel. Therefore, malicious user-level and kernel-level keyloggers are denied access to any usable information. GuardedID doesn't detect or remove keyloggers — it just blinds them.

We tested GuardedID against a number of user-level and kernel-level keyloggers. GuardedID managed to beat each and every keylogger we threw at it. Instead of revealing keystrokes, it showed useless strings of characters. We tried various web sites including banking institutions and shopping sites and found no problems.

Although we are not aware of any current software designed to circumvent GuardedID, it is hard to say how well it will work once crackers begin to target it explicitly. But one major advantage of GuardedID is that it doesn't require any spyware database updates. It works straight out of the box.

The version we tested wasn't compatible with Firefox, Opera, Safari for Windows or Windows Vista. However, StrikeForce is working on Firefox and Vista versions which should be out soon. If you still use IE, then we recommend GuardedID for making your online experience safer.

Peter Sbarski

CONTACT	StrikeForce
ONLINE	www.guardedid.com
MARKET	SMB
PRICE	US$59.99

✔ Seamless; effective.

VERDICT ★★★½☆

✖ Only for IE; no Vista support yet.

Filedoyen 1.35

Old school file manager with some extras.

Filedoyen is a classic file manager with lots of additional features. There is an inbuilt archive manager, a hex editor, a file/folder comparer, an image viewer and a lot more. The program seems to be designed to leave even the most discerning power user satisfied. There are, however, a number of usability issues, particularly, in terms of the user interface and user interaction.

Filedoyen's file manager is standard. It works as a single or dual-pane window and behaves similarly to Windows Explorer. Initially it was a tad disconcerting to use because the mouse interaction wasn't consistent.

Bookmarking and file filtering are useful and intuitive. User feedback, however, could've been handled better. Instead of "The parameter is incorrect", the software should've reported, "A folder with the name you specified already exists". Not a big issue, but it does show that it needs polish. The archive manager is an excellent feature. It supports a good range of formats which means that you don't have to buy a separate utility to handle your rars and zips. It would be nice, however, to have more meaningful option names or context-sensitive help. The search utility is alright, although, with free applications such as Google Desktop or Windows Desktop Search, it's hard to imagine anyone using it.

The hex editor is basic but is still good to have. Same goes for the file and folder comparers. These features are not something you would use daily but they could come in handy.

While there are a lot of features packed into Filedoyen, the software needs to be more cohesive. The user interface looks about ten years out of date. It is too busy and the dialogs are too cramped. Filedoyen would benefit from a rethink, a new UI and a good polish.

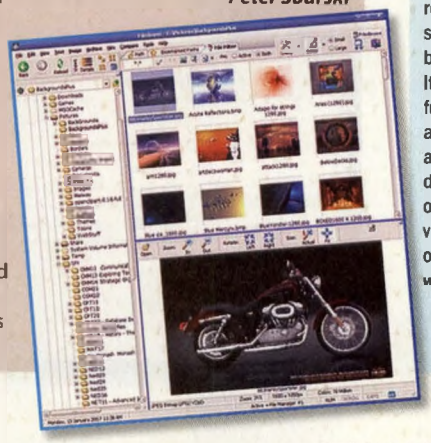
Peter Sbarski

CONTACT	Cowtec
ONLINE	www.filedoyen.com
MARKET	Everyone
PRICE	US$24.95

✔ Some good features; price.

VERDICT ★½☆☆☆

✖ Poor user interface; lacks polish.



AFFORDABLE MEGAPIXELS

The new Ricoh Caplio RR750 has to be one of the best value digital cameras on the market – with a 7.16-megapixel sensor, a 2.5in colour TFT-LCD monitor, 32MB of internal memory, and weighing only 130g – for just $179.

www.ricoh.com.au

SUN NOTEBOOK

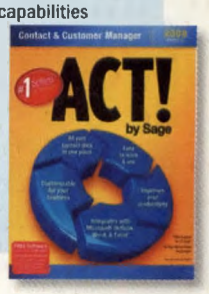
A new generation of semi-rugged notebook computers equipped with new touch screens viewable in direct sunlight has been released by Avantec, the Australian distributor of military grade notebooks from General Dynamics. One is the GoBook VR-2, with an Intel Core2 Duo processor and a sunlight-penetrating 13.3in touch screen display. The GoBook VR-2 is $5,499.

www.avantec.com.au

SAGE LAUNCHES ACT! BY SAGE 2008

Version 10 of the ACT! contact management and customer relationship management software has been launched by Sage Business Solutions. It features improved search functionality, enhanced administration capabilities and more deployment options. Pricing varies based on licensing.

www.act.com/



UNDERWATER DIGITAL CAMERA

Claimed to be the world's first waterproof digital movie camera, Sanyo's $699 VPC-CA65EXW (pictured) is waterproof without the need for an external housing accessory, allowing users to record their underwater adventures to a depth of 1.5m.

www.sanyo.com.au

NEW HD CAMCORDERS

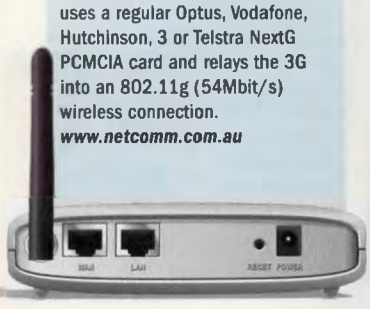
High definition is now obligatory if you're purchasing a camcorder. Panasonic's new HD camcorders, the $1,899rrp HDC-SD5 and $1,799rrp HDC-SX5 use the AVCHD format to record HD video with 1,920 x 1,080i resolution. Both come with Panasonic's original 3CCD camera system and optical image stabiliser technology to minimise the effect of hand shake.

www.panasonic.com.au

NEW ROUTER

NetComm has announced the N3G001W 3G Wireless Router – a multiple user, high-speed 3G connection to the internet. It allows the sharing of one PCMCIA 3G card so multiple users can access the internet from their notebooks or desktops simultaneously. The $229 router uses a regular Optus, Vodafone, Hutchinson, 3 or Telstra NextG PCMCIA card and relays the 3G into an 802.11g (54Mbit/s) wireless connection.

www.netcomm.com.au



Nero Linux 3

Blu-ray and HD DVD support for Linux, but can it beat K3b?

Disc burning under Linux is dominated by one application: K3b. Nero, then, has a tough road ahead if it wants to win over Linux users, especially as its product is closed source and commercial.

Luckily for Nero, its latest release for Linux has a massive feature: Blu-ray and HD DVD support. This is the first graphical burning tool to support the new disc formats. Nero offers version 3 as a week-long trial from its web site — this can be unlocked into a full release by buying a serial number.

The supported distributions include Fedora 4, RHEL 4, SUSE 10.0, Debian 3.1 and Ubuntu 5.10 (or newer versions of these distros), although, as the packages are supplied in both RPM and .deb format, you should be able to coerce it into running on other distributions. The app is built around Gtk, so it fits in well with modern desktops.

BURN BABY BURN

When started, Nero pops up a New Compilation dialog that sets up the burning session: choose the type of disc, give it a label and you're ready to go. Usefully, Nero lets you tweak various file system settings, and go beyond the limits of ISO 9660. Our only gripe here is that you can't fine-tune the write speed — you're limited to your drive's maximum setting, which is frustrating if you're using cheap media or want a slow burn to be on the safe side.

Creating disc images is blissfully simple: just drag files from the right-hand navigation tree into the disc pane and hit Burn. You're not confined solely to Nero's own file navigator, though, and can drag and drop files from Nautilus or Konqueror into the burning pane. The program presents a list of recognised burning devices and lets you create audio, data and mixed CDs, Mini DVDs, video DVDs, combined UDF/ISO DVDs, and Blu-ray and HD DVD images. When creating audio CDs, Nero can convert MP3s and Oggs into the appropriate format and can even ping the FreeDB audio CD database to get track details. A handy Expert Features pane lets you tweak potentially risky options, such as overburning and short lead-out.

Other features include multi-session support for updating previously burned discs, a simulation mode to check that settings are correct before burning, and support for blanking rewritable media. For writing existing disc images, Nero happily handles NRG, CUE and standard ISO files, and the program stores its disc layouts in .nlc files built from understandable XML. Feature-wise, it stacks up well against Burning ROM, its Windows cousin, although Nero hasn't yet ported any other components of its Premium suite, such as Nero Mobile or Sipps.

Sadly, a major stability gremlin reared its ugly head in our testing: massive lock-ups. Now, there are millions of software and hardware combinations in the Linux world, but this was on a vanilla Dell laptop running Ubuntu 7.04 and everything else was fine. If you're an Ubuntu fan and looking to buy Nero, we'd wait for a bug fix or workaround first.

If you're a regular Linuxer with a CD/DVD drive, happily running K3b or GnomeBaker, you won't find any incentive to switch at the moment. But if, on the other hand, you've got a shiny new Blu-ray or HD DVD writer in your possession — or you've just moved over from Windows and want a burning program you recognise — it's recommended. This is an important piece of software for Linux, but hold back until the company has sorted out the bugs.

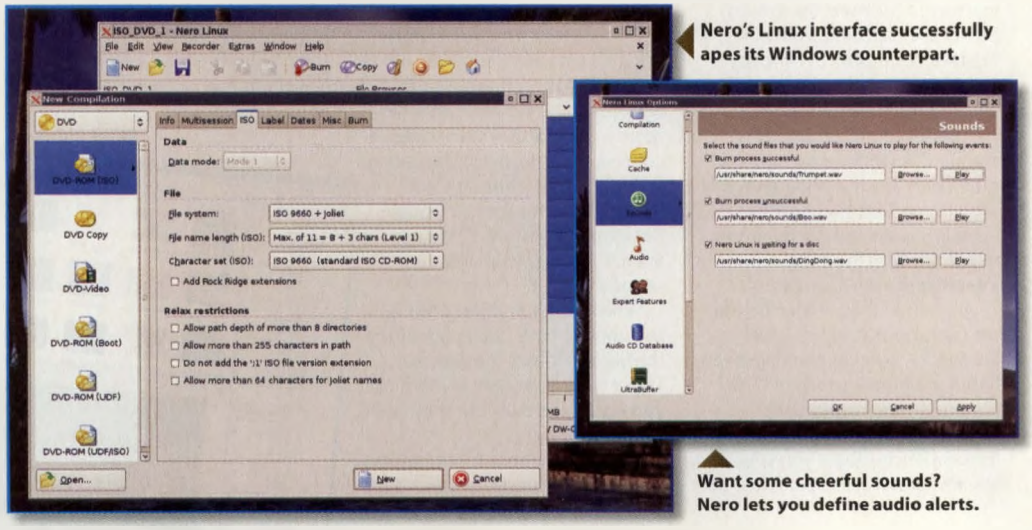
Mike Saunders

- CONTACT Nero
- ONLINE www.nero.com
- MARKET Everyone
- PRICE $29.95

✔ Blu-ray and HD DVD support.

VERDICT ★★★☆☆

✖ Buggy: wait for an updated version.



Nero's Linux interface successfully apes its Windows counterpart.

Want some cheerful sounds? Nero lets you define audio alerts.

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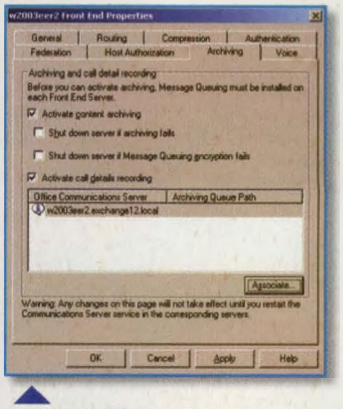
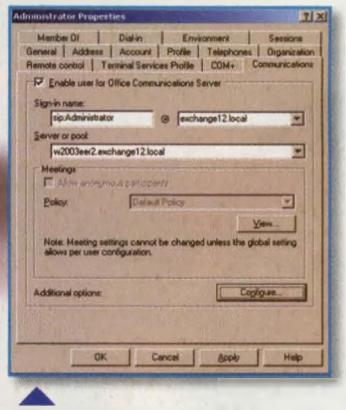
apc FIRST LOOK

Microsoft's Communicator Phone edition.



Big Brother knows where you are and he records everything you do!



Easy settings for each user.

Microsoft Office Communications Server 2007

There's no stopping Microsoft — Communications Server 2007 is designed to unify all of a business' communications.

Communicating in the business world used to be easy. There was phone, fax and snail mail. Then came email and mobile phones, totally changing the way we 'got hold of' people. And now we have Instant Messaging, blogs and VoIP.

IT vendors such as Microsoft, Cisco and others recognise that it's time to unify these different communications channels. From Microsoft comes Office Communications Server 2007 (OCS 2007), with some drastic improvements over its predecessor.

The previous version, Office Live Communications Server 2005, offered corporate-controlled IM and conferencing. OCS takes this further by enabling communication anywhere using both IM and VoIP, in a controlled and secure manner. The big news is VoIP and video conferencing, but OCS also offers strong collaboration tools. For the daring, there's also a new IP phone to go with OCS, improved archiving and call data records (CDR).

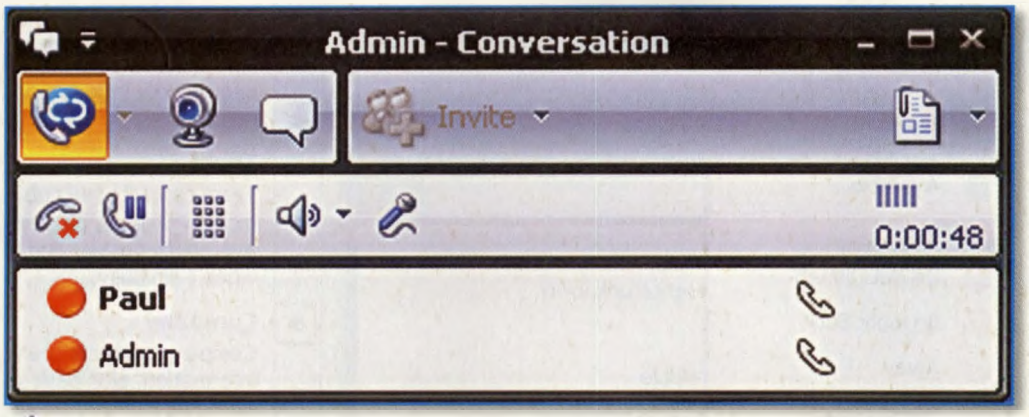
THE VISION

Imagine Peter in sales, connecting his laptop to the internet in a hotel somewhere and signing into his Office Communicator 2007 client. With Public Internet Connectivity (PIC), he's now part of the corporate phone network, can be reached by incoming phone calls and participate in conferences.

OCS makes this possible with internet-facing edge servers, digital certificates authenticating connections and encryption of all traffic. Peter makes phone calls simply by selecting a name from a list and doesn't have to remember people's phone numbers.

Or, picture Jane in marketing, who needs to work from home for a few days. She takes her Office Communicator Phone Edition in her bag and plugs it into her home ADSL router. It automatically connects in the same way as above — and as far as co-workers and clients are concerned, she's in the office.

Or Ralph in HR sending an IM message with a question to Bob, who realises his answer will take too long to IM back, so he calls Ralph back simply by clicking his name on the screen. Halfway through the conversation, they see that they need input from Anne, so she's added to the call, which now turns into an audio conference. If necessary, the conference can be escalated into a web conference with shared applications and a



Making a call really is a one-click affair.

INSIDE INFO

- OCS home page **office.microsoft.com/en-us/communicationsserver/FX101729111033.aspx**
- Trial download of OCS **technet.microsoft.com/en-us/evalcenter/bb684921.aspx**
- Microsoft Unified Communications home page **www.microsoft.com/uc**

whiteboard area. Or, if video would make points clearer, webcams can be used to enhance the communication.

MICROSOFT VoIP

The ace card in OCS 2007 is Enterprise Voice, Microsoft's term for software-based Voice over IP (VoIP). Most people have heard of Skype and other personal VoIP systems, but their use in businesses is generally frowned upon. The IT department has no control over the traffic and no way of monitoring it.

This means that corporate secrets can too easily 'walk out the door'; but on the other hand, the benefits these communications systems bring can't be ignored.

OCS offers the best of both worlds, with centralised policies, archiving of all communications and secure, encrypted traffic. Microsoft's take is to add an enterprise-grade software VoIP system to your existing Personal Branch Exchange (PBX) and integrate the two — not rip out the old/replace with the new.

ALL PRESENT AND ACCOUNTED FOR

One of the biggest problems with traditional phone systems is that you have no way of knowing whether the person you're trying to reach is available to take your call. The result is a game familiar to us all: phone tag.

Contrast this with an IM system where you can instantly tell if someone is away, busy or in a meeting. OCS takes this one step further with Enhanced Presence, where you can group your contacts ('buddy list') based on their relation to you: Personal, Team, Company and Public.

People classed as Personal can see all your contact information and will be privy to all details of your current availability. Team members get most information and can reach you when you're in a meeting (company contacts, by contrast, can't and also aren't privy to your mobile number). Public contacts will only see basic presence information.

The second challenge with IM systems is that you have to specify your presence status manually. OCS helps here by integrating with your Outlook calendar to automatically set 'busy' when you're in a meeting. It also uses mouse and keyboard activity and, of course, what you're doing in Communicator to see if you're in a call or conference.

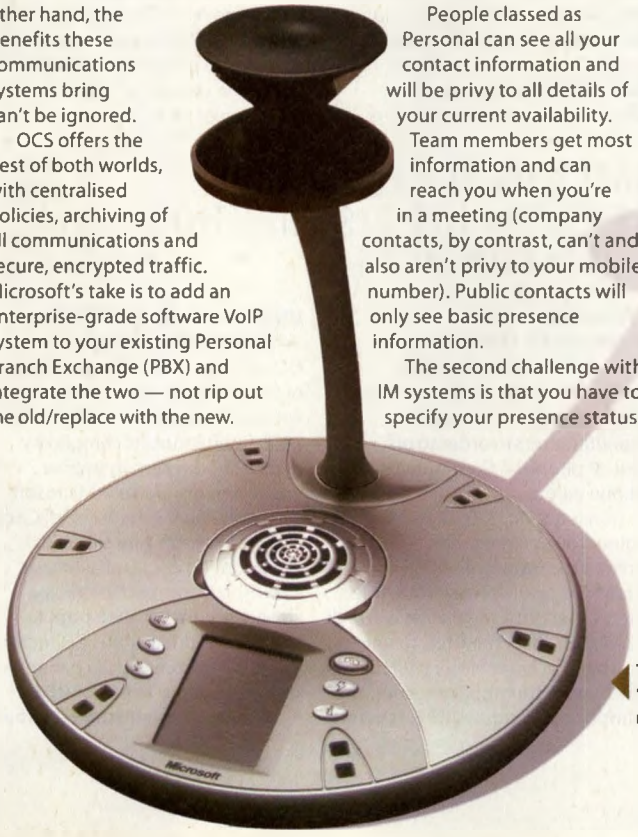
Administrators can also specify custom presence states, like 'interviewing', for instance.

Enhanced Presence also extends to email — you can directly see when reading an email what the status of the sender is. SharePoint also shows the status of document authors, and it's easy for developers to add presence to in-house applications. These icons can be clicked to initiate communication.

The problem with public IM systems for IT departments is the same as with Skype for VoIP: there's no control. Using Federation in OCS, your internal system can be securely connected to AOL, Yahoo! and the MSN/Windows Live networks. If you work closely with specific business partners, a direct link from your OCS system to theirs can also be established in a secure fashion. Conversely, unwanted visitors from other domains can be put on a deny list.

COMMUNICATE ANYWHERE

The main client for OCS is Office Communicator 2007, which offers access to all the functionality of OCS 2. There's also a client for Smartphones (Windows Mobile 5 and 6).



This surely is the winner of the 'coolest gadget in the conference room' competition.

For conferencing scheduling, there's an Outlook add-in that works with all versions from 2000 to 2007.

If a meeting escalates into a web conference with slide sharing and the like, OCS also offers the Office Live Meeting 2007 client. When you're stuck on the road with no device of your own, OCS can be used through Communicator Web Access (CWA), a web interface which runs on your public-facing OCS server.

All of these automatically traverse NAT firewalls to connect back to corporate OCS servers seamlessly, using the Interactive Connectivity Establishment (ICE) standard.

If you have several devices, all of them can ring simultaneously and you can choose where to answer, or, alternatively, the call can be directed to voicemail. It's easy to choose what to answer because incoming phone calls can be given a subject, just like emails.

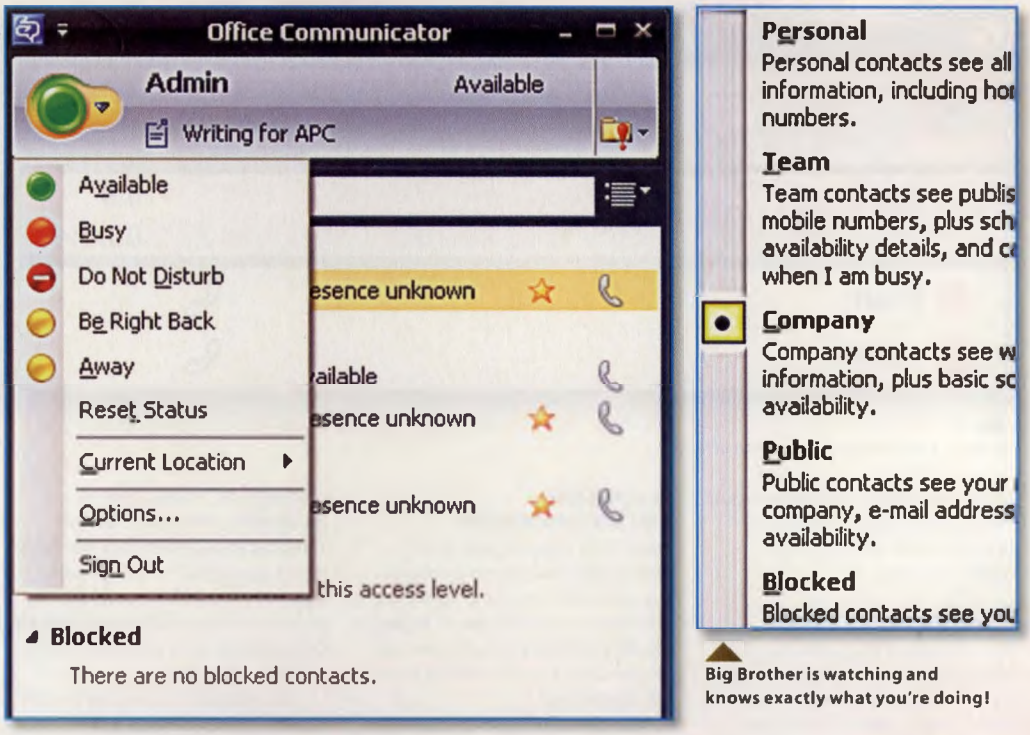
Managing multiple calls no longer requires cryptic 'on hold' codes on a phone: Communicator simply opens a new tab for each one and you switch between them with a mouse click.

To be able to make voice calls, you need speakers and a microphone or a USB headset.

If you'd like someone to call you back, you can put a link in an email which will call you back when clicked.

Communicator now supports Rich Text Format (RTF) for IM, so you can send clips from Excel and other applications simply by cutting and pasting.

Meet your new Microsoft IM friend.



Big Brother is watching and knows exactly what you're doing!

CONFERENCING HAS NEVER BEEN SO MUCH FUN

Scheduled meetings are handled through an Outlook add-in which emails invitations to participants. Impromptu meetings are started when an IM conversation or a voice call is extended by inviting more participants.

Meetings can be closed (available to invited participants only), for authenticated users only or open to anyone. Focus is a part of the conference server — it initiates conferences, authenticates participants, notifies users of changes (users joining or leaving) and enforces policies.

When full audio, video, app sharing and presentation slides are needed, OCS offers Live Meeting. The present offering of Live Meeting is a Microsoft-hosted service, whereas the OCS version is driven by internal servers.

ARCHIVING

One business feature that sets OCS apart from consumer IM/VoIP systems is automatic archiving. Based on policy, all IM, voice and conferencing content can be archived centrally.

New in OCS is a feature borrowed from the telephony industry, Call Details Record (CDR) — this collects IM, VoIP and meeting usage statistics for analysis or charging.

The archiving also helps end users: they can search through IM conversations, emails, voice calls and conference content for a particular topic.

OCS BUILDING BLOCKS

The challenge with building a phone system using software is the expectation that we have of phones. They just work — pick up the handset and you always get a dial tone. Compare this with many IT systems whose reliability can be sketchy at times.

For small-to-medium business, the Standard version of OCS is a good fit, although it doesn't offer high availability. All roles run on the one server with a local SQL Server Express database. New in OCS is that a single server only requires one digital certificate, no matter how many services run on it.

Microsoft recommends fewer than 5,000 users for Standard — above that, the Enterprise version separates functionality from data storage. Pools of front-end servers connect to a back-end SQL Server database. With the Enterprise version, a separate Archiving server is recommended; a Mediation server provides connectivity to existing PBX systems and the Director offloads the authorisation of users from the IM and Voice front-end servers. Security is on hand in several ways in OCS, not the least with IM filtering out selected file types and options for blocking SPIM (like spam but through IM).

Installation of OCS is a fairly complex effort, but there are lots of wizards to lead you through every step.

The big kahuna in Exchange 2007 is Unified Messaging, offering voice mail access in Outlook and the option to call Exchange from a phone and have your emails and calendar read back to you. OCS integrates with Exchange and can use Exchange distribution groups to find contacts. If you don't have a PBX, the Exchange auto attendant can function as one, with OCS providing phone functionality.

The codec used for OCS VoIP is Microsoft in-house-developed, rather than Global IP Sound (GIPS), which is used in Skype and Google Talk. Management of OCS is done through a standard MMC console — user settings are accessed through a new tab in Active Directory Users and Computers.

OCS INTEGRATES WITH EXCHANGE AND CAN USE EXCHANGE DISTRIBUTION GROUPS TO FIND CONTACTS

WOULD YOU LIKE A PHONE WITH THAT, SIR?

With OCS now offering VoIP functionality, Microsoft has also partnered with hardware manufacturers in order to offer a new IP phone — Communicator Phone edition.

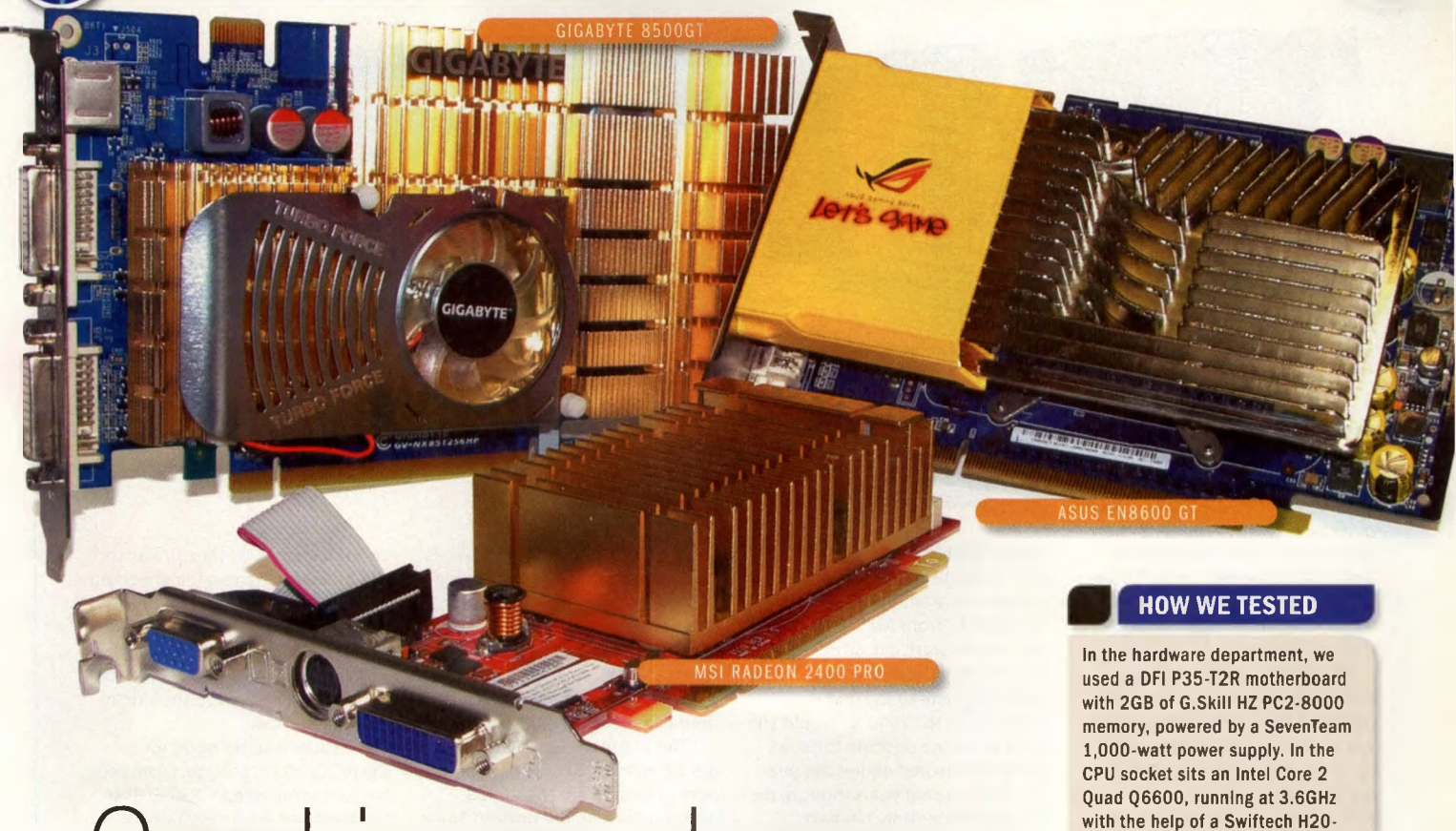
It has a 5.7in, 320 x 240 colour touchscreen that mimics the interface of Office Communicator with a contacts list etc. For security, the phone will lock itself after a few minutes; to unlock, you have to enter either a PIN or use the built-in thumbprint reader. The phone runs Windows CE 5, supports DHCP, VLAN, PoE (Power over Ethernet) and can download updates from an in-house WSUS server. When you have missed calls, these appear as a list so you can choose whom to call back; voicemails are also listed.

For boardroom video conferencing, OCS supports Microsoft's Roundtable 360, a new conference phone that identifies the active speaker and broadcasts a closeup of their face.

UNIFIED COMMUNICATIONS — THE BATTLE IS ON!

OCS is impressive, offering plenty of functionality and, when paired with the Communicator Phone, a really useful tool. Its complexity makes deployment in smaller environments unlikely. Microsoft isn't alone on this battlefield; Cisco and others have very capable products. Time will tell whether Microsoft's approach of having strong integration with popular existing products (Active Directory/ Windows, Office and Exchange) will prove a winning ticket for OCS.

Paul Schnackenburg



Graphics cards labs challenge!

***Shane Baxtor* looks at the spread of graphics cards from Nvidia and AMD for both gamers and in the lounge room.**

The quest for the perfect frame rate is one that doesn't seem like it's going to end anytime soon. The humble graphics card does so much for us, be it pulling 100fps in your favourite game, or outputting that perfect 1080P image to your LCD TV.

DirectX 10 has filtered across the whole line-up of graphics cards from Nvidia and AMD, and it's now possible to buy a card with as little as $50 (or to spend over $1,000).

Outside of DirectX 10, the next big feature on the list for Nvidia and AMD seems to be hardware video decoding. It doesn't matter if you're a fan of HD DVD or Blu-ray - these two formats are bringing full 1080P video to home theatre enthusiasts everywhere.

AMD is making the push for 1080P with HDMI and a feature called UVD (or Unified Video Decoder). Nvidia doesn't seem to have made the jump to HDMI just yet, but it's implementing PureVideo HD as its decoding feature of choice. UVD and PV HD are hardware-accelerated decoding features designed to offer you the best viewing experience in the intensive world of 1080P video. The technology works by taking the load off your CPU and placing it onto the graphics card, this giving you the best playback possible.

The choice to purchase the right video card has never been an easy one in the past; the bad news is that it's even harder now thanks to the large line-up that both AMD and Nvidia offer. The most expensive graphics card might not necessarily be the right one for you. We're going to take you on the ride that is the graphics card rollercoaster — and examine the top-to-bottom models from AMD and Nvidia while investigating hardware-decoding, SLI and CrossFire, and also how particular companies attack the model.

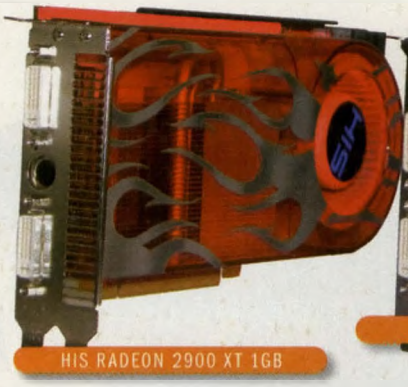
AMD

Who would ever have thought that we'd be talking about graphics cards from AMD? With the purchase of ATI last year, AMD now owns a significant portion of the graphics card industry. As they're continuing to use the well-known ATI Radeon name, we find the whole purchase hasn't affected the consumer a great deal. DirectX 10 graphics cards from AMD come in under the HD 2000 naming scheme, with the HD 2900 series sitting at the top and the HD 2600 and HD 2400 sitting just below it to fill up a whole high-to-low range line-up.

What ATI was best known for was official monthly driver updates which covered everything from bug fixes to performance, and what most enthusiasts would also call a superior image quality. Fortunately, these traits have carried on since AMD's acquisition, and all that is needed now are some good graphics cards to pair up with the excellent level of support.

HOW WE TESTED

In the hardware department, we used a DFI P35-T2R motherboard with 2GB of G.Skill HZ PC2-8000 memory, powered by a SevenTeam 1,000-watt power supply. In the CPU socket sits an Intel Core 2 Quad Q6600, running at 3.6GHz with the help of a Swiftech H20-120 Compact cooler. 3DMark06 allows us to determine where each model sits along with the help of real-world DX 10 games like Company of Heroes, Lost Planet and Call of Juarez running at medium settings under Windows Vista. All AMD cards are tested using the Catalyst 6.9 driver set, while anything from Nvidia uses the 162.22 driver.


HIS RADEON 2900 XT 1GB

ASUS EN8600 GT

BFG TECH 8600 GTS OC

BFG TECH 8800GTX OC2

> THERE ARE STILL A NUMBER OF ISSUES WITH CROSSFIRE WHICH PREVENT IT FROM BEING THE PERFECT SETUP

NVIDIA

At the top of its game at the moment, Nvidia seem to be dominating the video card market quite heavily. The release of the 8800 series came at the perfect time, and delay after delay for the HD 2900 series from AMD meant that Nvidia had a huge jump on the competition.

Nvidia has been running extremely hot for years now, with excellent chipsets since the nForce 2 and a strong graphics card line-up that has kept it in the lead since the 6000 series (where we saw the ever popular 6600GT). Nvidia just doesn't seem to be able to make a mistake.

Under the 8000 naming scheme we see the 8800 series at the top of the ladder with the 8600, 8500 and 8400 series following. While official drivers aren't as regular as those of AMD's, the sister nZone site has a constant flow of beta drivers to keep the enthusiasts at bay.

AMD HD 2900 SERIES

Hurt by huge delays and poor performance when launched, the HD 2900 XT from AMD got off to a very rough start. If it wasn't for the monthly Catalyst drivers being tested, it's safe to say that the $1,500-plus HD 2900 XT would still be in the same position today as when it launched earlier this year.

Unlike recent years though, the HD 2900 series only has two models, which are both under the XT naming scheme. The original model launched with 512MB of GDDR3 memory and came in clocked at 750MHz on the core and 1,650MHz on the memory.

A few months on we saw AMD release the 1GB model, which utilised the same core speed but, thanks to the move to GDDR4, we saw the memory speed increase to a default clock of 2,000MHz. While pre-overclocked HD 2900 cards are still few and far between, the recently relaunched company 'Diamond' has taken it upon themselves to push the memory up a further 200MHz, making the memory speed 2,200MHz.

This in turn has helped us get an even bigger increase in performance from the 512MB offering, though the bottom line is that the gains are seen more so because of the speed increase on the GDDR4 memory, rather than the huge amount of memory.

Whilst the whole series is marketed as a performance card for gamers, the lack of UVD is disappointing — the thought behind not including it was that users of the HD 2900 series of cards are most likely running a powerful enough system that the processor will be able to handle the encoding of high-definition video. While for the most part this is probably true, the fact that cheaper cards (priced well below that of the HD 2900) do get it is something you shouldn't have to swallow.

The future looks good for the HD 2900 XT, though: Diamond has just announced a 2GB GDDR4 model aimed at workstation users who need the extra memory on their graphics cards, and the continuing monthly releases of drivers from AMD show performance gains not only in single-card form but also in CrossFire.

While there are still a number of issues with CrossFire which prevent it from being the perfect setup, the 512MB HD 2900 XT is a great option

PRODUCTS BENCHMARKED	3DMARK06 1,280 x 1,024	3DMARK06 1,600 x 1,200	COH 1,280 x 1,024	COH 1,600 x 1,200	LOST PLANET 1,280 x 1,024
HIS Radeon HD 2900XT 1GB GDDR4 CrossFire	14,378	13,314	47.1	42.6	56
Diamond HD 2900 XT 512MB GDDR3 CrossFire	12,775	10,810	48.2	43.1	75
Sapphire Radeon HD 2900 XT 512MB GDDR3 CrossFire	14,349	13,388	47.2	42.5	56
MSI Radeon HD 2900 XT 512MB GDDR4	12,270	10,571	47.5	42.6	70
MSI Radeon HD 2600 XT 512MB GDDR3	5,573	4,614	25	19.1	29
Sapphire HD 2600 XT 256MB GDDR3	4,966	4,087	23.4	17.8	27
Palit HD 2600 PRO 256MB Sonic	4,141	3,375	18.1	13.5	21
Palit HD 2400 XT Sonic	2,288	1,809	7.5	5.5	13
MSI Radeon HD 2400 PRO 256MB	1,495	1,172	5.4	3.9	9
XFX 8800 Ultra XXX	14,031	12,474	56.6	50.6	121
BFG Tech 8800GTX OC2	13,014	11,450	53.5	45	110
Palit 8800GTS 640MB	9,321	8,039	39.2	33	83
BFG Tech 8800GTS OC	10,076	8,685	42.1	36	104
BFG Tech 8600GTS OC	6,212	5,053	23.9	18.6	49
ASUS EN8600GT Silent	4,592	3,679	19.1	14.4	35
Gigabyte 8500GT TurboForce Ultra	3,451	2,708	13	9.4	26
PixelView 8400GS	1,403	1,071	7.3	5.1	11

for performance users, be it in single form or CrossFire. The HD 2900 XT 1GB card on the other hand isn't as appealing, thanks to the increased cost and minimal performance gain.

AMD HD 2600 SERIES

If you find that the HD 2900 is simply out of your price range, the big seller for AMD will of course be the mid-range line-up. The HD 2600 series currently consists of a GDDR4 and GDDR3 XT version as well as a PRO model that also comes in with GDDR3.

Starting at the mid-$100 mark for an HD 2600 PRO and climbing to the low-$200 mark for the top-of-the-line GDDR4 XT variant, AMD seems to have covered the whole mid-range price bracket very well.

While the XT versions are more aimed at the casual gamer, the PRO offering from Palit gives us native HDMI and a shortened length, making it the perfect companion for a home theatre PC. Of course, with UVD also implemented into the HD 2600 series, you don't need an overkill processor to take care of Blu-ray or HD DVD playback.

You end up with a model that is not only capable at gaming at resolutions around 1,280 x 1,024 but one that's also quite suitable in a home theatre PC, without breaking the bank.

The biggest let-down to the HD 2600 series is the complete lack of marketing on the line-up from AMD, and thus the lack of knowledge of these cards in the market. If you're looking for a $200 graphics card, there really isn't anything better than the 2600 series. If you find yourself wanting a very capable card for your HTPC, the 2600PRO with native HDMI offers huge value for money and gives you the chance to do some gaming at the same time.

The HD 2600 XT GDDR4 also manages to offer great value for the casual gamer — and with the added bonus of excellent HTPC capabilities. The GDDR3 variant is also a decent card, but we would recommend you spend the extra $20 and make the move to the higher-clocked and better-performing GDDR4 model.

AMD HD 2400 SERIES

If you find yourself wanting to stay with AMD and you're looking for something under $100, your two choices are the HD 2400 XT and HD 2400 PRO, which sit at the bottom of the AMD graphics card pyramid. While both cards implement a 64-bit memory bus, the XT comes standard with GDDR3 memory, whereas the slower PRO only has GDDR2.

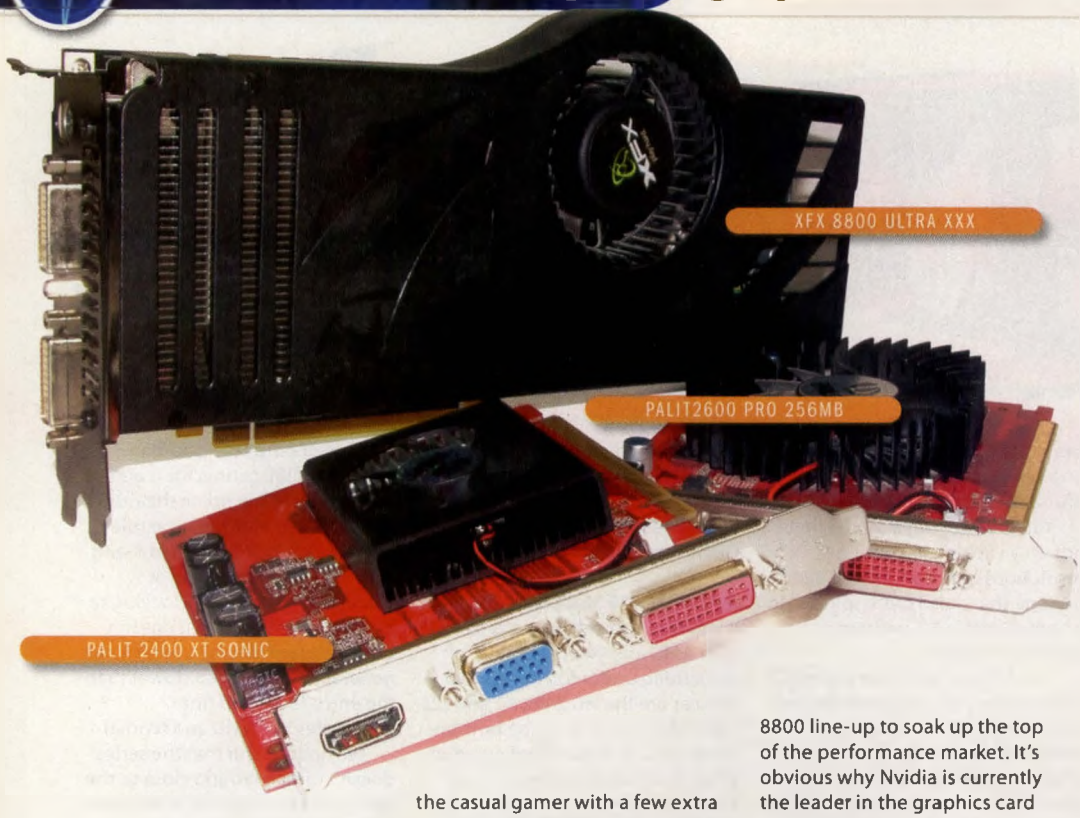
3D performance is pretty poor on both models, but people needing a Dual Link DVI connector on the cheap are in luck. With both models supporting UVD, it's clear that the cards are best-suited to a home theatre-type environment where the machine will be doing no gaming whatsoever. Palit offers a native HDMI port on their card, while MSI offers a DVI port, which is capable of outputting audio when a DVI-to-HDMI connector is added.

Outside of the home theatre segment, the only other people that would opt for such a low-end card are system builders, or someone who is simply looking to buy a motherboard that doesn't offer onboard graphics (which has generally always been slower than the entry-level card from companies like AMD and Nvidia).

We understand that the series doesn't offer anything close to the performance of the HD 2600 series, but, with that said, the cards are extremely capable for their target audience — with the inclusion of technology like UVD, HDMI and Dual Link DVI connectivity on such a cheap graphics card, they really give you the sense of value for money.

With all the connection options you need, combined with UVD, the 2400XT is a good option for HTPC users. If you can find a PRO version with HDMI you're laughing, as it will be cheaper again. However,

LOST PLANET 1,600 x 1,200	CALL OF JUAREZ 1,280 x 1,024	CALL OF JUAREZ 1,600 x 1,200	POWER DRAW (IDLE)	POWER DRAW (MAX)	PRODUCTS BENCHMARKED
49	44.9	42	313	555	HIS Radeon HD 2900XT 1GB GDDR4 CrossFire
58	53	43	235	407	Diamond HD 2900 XT 512MB GDDR3 CrossFire
50	50.6	41.8	312	533	Sapphire Radeon HD 2900 XT 512MB GDDR3 CrossFire
54	50.4	40	228	397	MSI Radeon HD 2900 XT 512MB GDDR4
24.5	21	18.1	194	271	MSI Radeon HD 2600 XT 512MB GDDR3
20	21.5	15.5	188	261	Sapphire HD 2600 XT 256MB GDDR3
15	16.3	12.9	177	219	Palit HD 2600 PRO 256MB Sonic
9	9.9	7.3	178	241	Palit HD 2400 XT Sonic
6	6.6	4.8	175	224	MSI Radeon HD 2400 PRO 256MB
108	61.5	51.6	268	399	XFX 8800 Ultra XXX
103	55.4	46.4	250	391	BFG Tech 8800GTX OC2
72	40.2	31.1	199	280	Palit 8800GTS 640MB
76	42.6	33.2	192	276	BFG Tech 8800GTS OC
33	20.3	15.1	196	243	BFG Tech 8600GTS OC
24	16.4	12.1	186	288	ASUS EN8600GT Silent
18	13	9.9	187	245	Gigabyte 8500GT TurboForce Ultra
8	5.9	4.2	147	182	PixelView 8400GS



you're not going to be doing any decent gaming on either model due to the limited memory bus.

NVIDIA 8800 SERIES

With AMD's offerings out of the way, it's time to have a look at what exactly Nvidia has — and the 8800 series would definitely be one of the most popular line-ups of cards we have seen in a long time.

The line-up consists of four models, with the 8800 Ultra sitting at the top of the ladder — it carries with it a high price tag and an absolute bucketload of performance. Released just before the HD 2900 XT, this card was designed to simply take attention away from AMD and is still the fastest single-card solution on the market. The biggest problem with the card is its value for money (or lack thereof).

That's where the cheaper 8800GTX comes in: it was the original flagship model in the 8800 line-up when launched. Both GTX and Ultra 8800s are only sold with 768MB memory — most companies offer overclocked models, which can give quite a serious boost in performance.

While the GTX and Ultra might be out of reach for most, the 8800GTS is the card of choice for the casual gamer with a few extra dollars in their pocket. Coming in two variants, there is a 640MB model and a 320MB one. These cards sit at $550 and $450 respectively and quickly became the choice for anyone who really wants a platform that supports DirectX 10 gaming.

The 320MB model is one of the best value-for-money video cards currently on the market, and for good reason. If you find yourself gaming at around the 1,600 x 1,200 or 1,680 x 1,050 (for those wide-screen users) resolutions, it's absolutely perfect. The 640MB model, on the other hand, while better when moving up in resolutions, carries a similar price tag to the HD 2900 XT and at times can be a fair bit slower.

Like the HD 2900 XT from AMD, Nvidia is not including hardware decoding into their top series, which again is slightly disappointing. PureVideo HD is only found in the 8600 series and below.

While the HD 2900 XT is a great card, it really only goes up against the 8800GTS 640MB, leaving three other models in the 8800 line-up to soak up the top of the performance market. It's obvious why Nvidia is currently the leader in the graphics card department.

The whole 8800 line-up is excellent, but the ridiculous price tag on the Ultra model is a real turn-off. The GTX offers some serious performance, though, and at a considerably better price point. The release of the HD 2900 XT means that the 640MB 8800 GTS has dropped significantly, when it comes to value for money, though the slack has been picked up with the 320MB version, which is simply one of the best-valued cards on the market.

8600 SERIES

If the budget doesn't let you venture into 8800 territory and you're still looking for a decent-performing card, chances are the 8600 is where you should be looking. $300 doesn't get you anything from AMD, so the 8600GTS is a fantastic option.

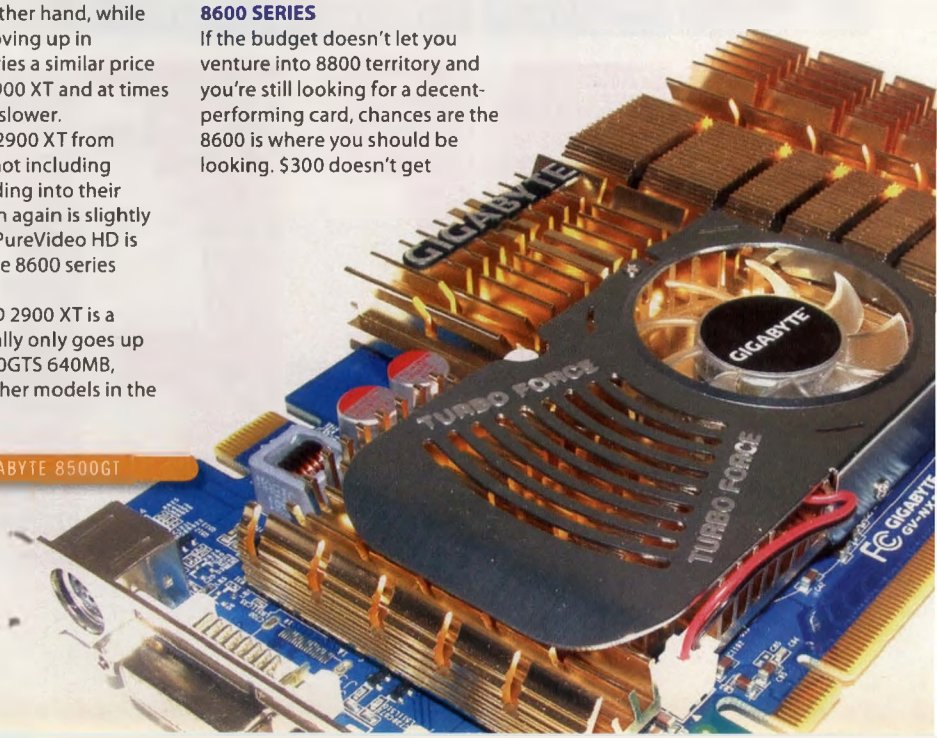
While not a bad choice for people wanting a graphics card for their home theatre system (thanks to the implementation of PureVideo HD), the large price tag doesn't make it a very affordable option unless you wanted to do some gaming at the same time.

The GT version offers a very poor performance-to-cost ratio and makes it an unattractive purchase. On the other hand, the GTS version offers great performance. Being the only card in the $300 bracket, this makes the GTS a real winner for the casual gamer. While PureVideo HD is included on both models, the aggressive pricing from the HD 2600 series makes the GTS and GT a pretty bad-value card for an HTPC.

8500 SERIES

Coming down to the $100 mark, we have the 8500GT, which is the only card in the series at the moment. A cheaper price tag and PureVideo HD makes it a more attractive option, but performance isn't fantastic. Gigabyte has managed to do some great work with the 8500GT, though: the standard GDDR2 model lacks a fair bit of 3D punch, which the TurboForce edition from Gigabyte offers.

The base model is fairly cut down in specifications when compared to the bigger 8600, and the value of the AMD HD 2600 series makes the 8500GT even less desirable. Instead of being placed in its own series as a 'GT' card, the



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8500GT should have come under the GS naming scheme in the 8600 series (ie. the 8600GS). The standard model's performance is mediocre at best, meaning that it's best-suited for an HTPC. Unfortunately, due to it lacking features like HDMI, its value isn't fantastic and, if it wasn't for Gigabyte really ramping the model up with their TurboForce variant, it isn't a model that would come up for consideration at all.

8400 SERIES

Finally you find yourself at the 8400GS, which is the only model carrying the 8400 name. This card does have its uses, thanks to the low-profile nature and PureVideo HD implementation, but, thanks to the 64-bit memory bus, 3D performance is less than desirable. It's around the same price as the HD 2400 PRO, and if it wasn't for the fact that the card can fit nicely into a low-profile case, we wouldn't recommend it to anyone.

MULTI-CARD TECHNOLOGY

SLI and CrossFire are the technologies that Nvidia and AMD use respectively to combine the power of two cards, in turn creating an even more powerful setup. Using an internal bridge system and a compatible chipset, the two cards are able to work together and give you a boost in performance of up to 80% in applications that are able to make use of the technology.

While a lot of people use the 'buy a mid-range card now and a second one later' mentality, the logistics of finding a card the same as you bought six months ago can be difficult, especially thanks to the short lifespan of models these days. Someone who purchased a 7600GT three months ago would have no luck today finding another at their local computer store. The technology is best-suited for high-end cards and people who want the best — instead of using the buy-now mentality, your best bet is to simply sit back a little longer and collect a few more pay cheques (then buy the next model up).

Ultimately, this setup is only really suited to users of large 30in monitors that offer a native resolution of 2,560 x 1,600. The huge resolution strains a single card setup, and moving to CrossFire or SLI is the difference between an enjoyable experience and a disappointing one.

It isn't all good news for people who choose to jump on the multi-card bandwagon, though, with some games getting very little to no benefits, whilst others find performance actually becoming worse than what a single-card solution provides. AMD and Nvidia are constantly working on fixing these bugs, though, so hopefully the issues are only short-lived.

MOTHERBOARDS

To make use of SLI or CrossFire you will need to make sure you're

	HIS RADEON 2900 XT 1GB	DIAMOND HD 2900 XT 1GB	SAPPHIRE 2900 XT 1GB	MSI RADEON 2900 512MB	MSI 2600 DIAMOND 256MB	SAPPHIRE 2600 256MB	PALIT 2600 PRO 256MB	PALIT 2400 XT SONIC
Web	www.hisdigital.com	www.diamondmm.com	www.sapphiretech.com	www.msicomputer.com.au	www.msicomputer.com.au	www.sapphiretech.com	www.palit.biz	www.palit.biz
Price	$1,598	$799	$1,238	$619	$219	$199	$149	$99
GPU	Radeon HD 2900 XT	Radeon HD 2900 XT	Radeon HD 2900 XT	Radeon HD 2900 XT	Radeon HD 2900 XT	Radeon HD 2900 XT	Radeon HD 2600 XT	Radeon HD 2400 XT
Memory quantity	1GB	1GB	512MB	512MB	256MB	256MB	256MB	256MB
Memory type	GDDR4	GDDR4	GDDR3	GDDR3	GDDR4	GDDR3	GDDR3	GDDR3
Memory bus	512-bit	512-bit	512-bit	512-bit	128-bit	128-bit	128-bit	64-bit
Core Clock	750MHz	750MHz	750MHz	750MHz	850MHz	800MHz	800MHz	700MHz
RAM Speed	2,000MHz	2,200MHz	1,650MHz	1,650MHz	2,300MHz	1,400MHz	1,400MHz	1,500MHz
Stream Processing units	320	320	320	320	120	120	120	40
Texture units	16	16	16	16	8	8	8	4
ROPS	16	16	16	16	4	4	4	4
Interface	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16
Power connector	6-pin PCI-E, 8-pin PCI-E	6-pin PCI-E, 8-pin PCI-E	6-pin PCI-E, 8-pin PCI-E	6-pin PCI-E, 8-pin PCI-E	None	None	None	None
Outputs	DVI x 2, VIVO	DVI x 2, VIVO	DVI x 2, VIVO	DVI x 2, VIVO	DVI x 2, HDTV out	DVI x 2, HDTV out	DVI, VGA & HDMI	DVI, VGA & HDMI
Cooler	Fan	Fan	Fan	Fan	Fan	Fan	Fan	Fan
✔	High-res gaming performance.	Performance; overclocked.	High-res gaming performance.	Excellent value.	Excellent value for money.	Good bundle; single slot.	Native HDMI; short length.	Native HDMI; short length.
✖	Small to no gains from 512MB.	Less value than 512MB.	Huge power usage.	No UVD; 8-pin power connector.	Dual slot; no free game.	GDDR$ is only a little more.	No HDMI cable.	Average 3D performance.
Verdict	★½☆☆☆	★★★½☆	★★★½☆	★★★★½	★★★★☆	★★½☆☆	★★★★½	★★★½☆

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getting the correct motherboard chipset. If you find yourself thinking that in the distant future you might get a second Nvidia card, the general idea is to get an Nvidia motherboard that supports SLI. The problem is that you find yourself limited to a certain line-up of motherboards. With a single-card solution it doesn't matter which motherboard chipset you purchase, meaning you can get the best one available on the market.

The motherboards of choice at the moment are built with Intel-made X38 and P35 chipsets, both of which will only support a dual-card setup using AMD's CrossFire and Radeon cards. While the 600i series of chipsets from Nvidia are very capable, the overclocking ability, general performance and features of the Intel offerings make them a far more desirable chipset. Intel has generally always created the best chipsets from a stability department, but, when AMD took over as the performance CPU of choice, they were quickly forgotten. It wasn't until the release of the 865/875 chipset years later that we saw Intel fight back — following these chipsets we've had a strong line-up from Intel, and, amongst enthusiasts, the ultimate chipset would undoubtedly be from them, offering support for both SLI and CrossFire.

CONCLUSION

From Nvidia and AMD there really is no clear winner, as AMD seem to have done a fantastic job of slipping cards into a price bracket that Nvidia doesn't cover. Sliding nicely into that $150-to-$200 range we have the HD 2600 PRO and HD 2600 XT cards. Then, as we move closer to the mid-$200 and $300-mark, Nvidia offers the 8600GT and 8600GTS.

Running it all down, your purchases should look something like this: with no particular budget limit, you should be having a look at the 8800 Ultra or GTX from Nvidia. If you're sitting at a $600 budget, go for the HD 2900 XT, and if you're looking more at the mid-$400 mark, the 320MB variant in the 8800GTS is your best bet. $300 really doesn't leave you much choice other than the 8600GTS, but, when you start moving down to the $200 mark, both the HD 2600 XT GDDR3 and GDDR4 models are perfect. $150 will land you an HD 2600 PRO, which is about the lowest you can go if you want to do any form of serious gaming. If you venture lower than the 8600 from Nvidia — or HD 2600 from AMD — this will do nothing more then leave a bad taste in your mouth as a gamer.

That said, if you're looking for a card to go into your media centre, the HD 2400, along with the 8500 and 8400, is more than capable, though with the implementation of HDMI on the AMD offerings, we will find ourselves always recommending them over Nvidia's alternatives. apc

	MSI RADEON 2400 PRO	XFX 8800 ULTRA XXX	BFG TECH 8800GTX OC2	PALIT 640MB 8800GTS	BFG TECH 8800GTS OC	BFG TECH 8600GTS OC	ASUS EN8600GT	GIGABYTE 8500GT	PIXELVIEW 8400 GS
Web	www.msicomputer.com.au	www.xfxforce.com	www.bfgtech.com	www.palit.biz	www.bfgtech.com	www.bfgtech.com	www.asus.com	www.gigabyte.com.au	www.pixelview-graphics.com
Price	$74	$1,258	$899	$569	$479	$315	$279	$129	$69
GPU	Radeon HD 2400 PRO	Nvidia 8800 Ultra	Nvidia 8800 GTX	Nvidia 8800 GTS	Nvidia 8800 GTS	Nvidia 8600 GTS	Nvidia 8600 GT	Nvidia 8500 GT	Nvidia 8400 GS
Memory quantity	256MB	768MB	768MB	640MB	320MB	256MB	256MB	256MB	256MB
Memory type	DDR2	GDDR3	GDDR3	GDDR3	GDDR3	GDDR3	GDDR3	GDDR3	DDR2
Memory bus	64-bit	384-bit	384-bit	320-bit	320-bit	128-bit	128-bit	128-bit	64-bit
Core Clock	525MHz	675MHz	626MHz	500MHz	550MHz	710MHz	540MHz	600MHz	450MHz
RAM Speed	800MHz	2,300MHz	2,000MHz	1,600MHz	1,600MHz	2,000MHz	1,400MHz	1,400MHz	800MHz
Stream Processing units	40	128	128	96	96	32	32	16	16
Texture units	4	64	64	48	48	16	16	8	4
ROPS	4	24	24	20	20	8	8	4	4
Interface	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16	PCI Express x16
Power connector	None	6-pin PCI-E x2	6-pin PCI-E x2	6-pin PCI-E	6-pin PCI-E	6-pin PCI-E	None	None	None
Outputs	DVI, VGA and HDTV out	DVI x 2, HDTV out	DVI x 2, HDTV out	DVI x 2, HDTV out	DVI x 2, HDTV out	DVI x 2, HDTV out	DVI x 2, HDTV out	DVI x 2, HDTV out	DVI, VGA, TV out
Cooler	Passive	Water	Fan	Fan	Fan	Fan	Fan	Fan	Fan
✔	Dual link DVI; AVIVO HD.	Performance; huge overclock.	Performance; warranty.	Free game; high performance.	Performance; good value.	Single slot; excellent cooler.	Silent cooler.	Build quality; smart fan.	PureVideo HD; low profile.
✖	Poor 3D performance.	Very expensive.	Price premium.	Less value these days.	No free game; lacks UVD.	No free game; expensive.	Expensive; runs hot.	Average performance.	Poor performance.
Verdict	★★★★☆	★★★½☆	★★★★☆	★★½☆☆	★★★★½	★★★½☆	★★☆☆☆	★★½☆☆	★★☆☆☆

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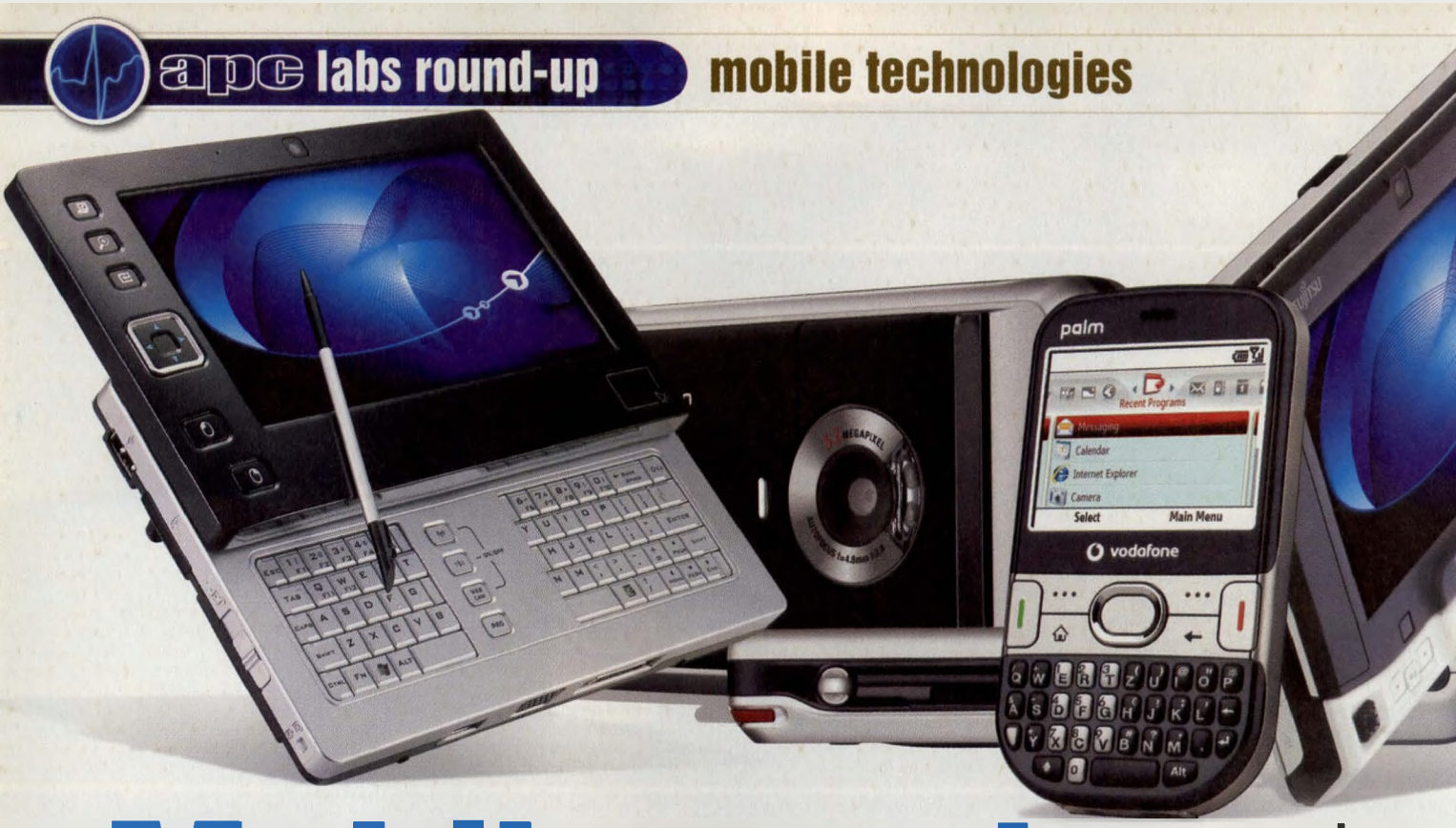


Mobile work tech

***Jenneth Orantia* compares the best smarphones and ultraportables for work.**

Working out of the office? Your options aren't limited to notebooks anymore. The latest generation of smartphones and ultramobile PCs are just as suitable for mobile working, and, in some cases, are better-designed for the rough-and-tumble lifestyle of the road warrior.

There's no silver bullet when it comes to mobility, and the best tool for the job will often depend on the tasks you need to accomplish. If it's just reading and replying to email, then a smartphone is usually the best option, as it combines multiple connectivity options with a highly portable form factor and a battery that should comfortably see you through the full work day.

Otherwise, a UMPC (which runs either Windows XP Tablet Edition or Windows Vista) is capable of handling most desktop-class tasks within a form factor that's halfway between a full-sized PDA and an ultraportable notebook.

For this roundup, vendors were invited to submit smartphones and UMPCs tailored for mobile professionals, although, by definition, devices falling under either category are targeted at that market anyway. A few vendors, including Nokia, HTC, HP and i-mate, were unable to supply their upcoming smartphones for review, but rumour has it that these will follow the current trend towards touchscreen and thumbboard-enabled devices.

In the early days, smartphone users were divided between the Windows Mobile, Palm and Symbian camps. Now, the distinction is less relevant, and vendors have adopted competitor technologies with abandon.

The poster child for this is obviously Palm, who, after years of actively promoting the Zen-like simplicity of its own operating system, stunned the industry by offering Windows Mobile on its Treo smartphones.

But Palm isn't the only company that's been bed-hopping. BlackBerry connectivity is already available as an option on a few Windows Mobile handsets, but the BlackBerry Application Suite (due later this year) goes further by emulating the complete BlackBerry experience as a virtual layer on top of Windows Mobile 6, down to the same applications, synchronisation and phone functionality.

Nor is there a strict divide between the mail platforms supported by each vendor. Most smartphones support both Exchange and BlackBerry mail, in addition to the standard POP and IMAP email, and a few also support lesser-known platforms like Good and Visto.

What this means for end users is that there's far more choice when it comes to smartphones, with less loyalty to individual brands and operating systems. Often, the decision can simply come down to features and form factor, and, in the latest generation of devices, there's a lot of diversity in both regards.

Wi-Fi is hardly a cutting-edge feature, but only half of the current smartphones support it. Some form of high-speed cellular connectivity is more the standard, whether that be 3G or HSDPA, but even that's not guaranteed if you're considering a BlackBerry (none of the current models support 3G).

Before you dismiss Wi-Fi as an unnecessary luxury, it's a feature worth considering if you travel overseas and don't want to be stung with roaming charges when you download email. Plus, VoIP applications like Skype and Truphone can be used over Wi-Fi for significantly cheaper local and international calls.

Another feature that's perfect for frequent travellers is GPS, which is finding its way onto an increasing number of mainstream handsets (no pun intended). The experience differs between devices, depending on the mapping solution used, but, in general, GPS-enabled smartphones are a surprisingly viable alternative to a dedicated satellite navigation device.

HOW WE TESTED

Before testing, we updated all the UMPCs using Windows Update. Third-party antivirus programs were removed and the Windows Sidebar was closed. We couldn't use 3DMark06 and PCMark05, as these require a minimum screen resolution of 1,024 x 768 pixels – instead, we used CrystalMark, which we ran using each UMPC 's native resolution and the 'High performance' power plan. Before battery testing, we turned off wireless networking and set the power plan to 'Power Saver'. We then disabled screen-off, sleep and hibernation.

In the advanced power options settings, we configured the display so it wouldn't turn off and disabled adaptive display. We also made the minimum processor state 5%, and maximum 50%, and turned the low battery level to 5% and critical level to 0%. Screen brightness was adjusted to 40% and Windows audio volume to 50%. Battery levels were tested by playing a DivX file in Windows Media Player and timing how long it took before the batteries ran out. There isn't a standard benchmarking application for smartphones, so to test performance we ran each device through a series of standard tasks, including making a phone call, writing a text message, receiving and replying to email and multi-tasking. To test battery life, we turned all power-saving options off, adjusted screen brightness and volume to 50%, and looped a video file until the battery ran down. If portability is paramount, it doesn't get more mobile than a smartphone. For basic tasks like email, light web browsing and document viewing, smartphones are remarkably adept, despite the smaller screen size, and options like Wi-Fi, GPRS, 3G and HSDPA make them a no-brainer for internet access.

THERE'S FAR MORE CHOICE WHEN IT COMES TO SMARTPHONES, WITH LESS LOYALTY TO INDIVIDUAL BRANDS AND OPERATING SYSTEMS

If the last time you looked at a smartphone was when they were hulking, battery-starved clunkers, it's time to look again. These days, many smartphones are virtually indistinguishable from other handsets, and, in the case of devices like the iPhone and the HTC Touch, actually give the fashion phone set a run for their money.

There's enough diversity in smartphone form factors to be able to pick one that best matches your usage patterns. Heavy emailers will find ample devices that sport a full QWERTY thumbboard, while those that prefer one-handed use will find many mobiles that stick to the conventional numeric keypad.

The recent release of the Apple iPhone in the United States has made touchscreens a more popular option in smartphones, even though devices that eschew hardware keypads for virtual ones have been available for years. What the iPhone brings to the table is a multi-touch technology that lets users interact with the touchscreen in new and innovative ways — all without resorting to a stylus.

The advantage of a full touchscreen is that there's significantly more room for web browsing, document viewing and multimedia. Of course, smartphones with touchscreens are more delicate, and less likely to survive a three-foot fall to the ground unscathed.

But what about the occasions when you need the full desktop experience? Up until a year and a half ago, this meant lugging around a laptop if you wanted to work out of the office. Now, you can opt for a UMPC: a device that bridges the gap between a PDA and notebook, with the same touchscreen functionality of a Tablet PC.

The UMPC platform was jointly developed by Intel and Microsoft in mid-2006, and, while features vary between models (much like a notebook), there are baseline specifications that a device needs in order to qualify as a UMPC, including a screen size of 7in or smaller, a minimum 800 x 480 resolution (with the ability to scale up to 800 x 600 and 1,024 x 600), less than 900g weight, landscape orientation, touchscreen and hardware controls, Windows XP Tablet PC Edition 2005 or Vista, an Intel Celeron M, Intel Pentium M or VIA C7-M processor and a minimum 30GB hard drive.

The first generation of UMPCs all used the slate form factor, and while this continues to be popular, the latest batch of devices offer a bit more variation. Thumbboard sliders are becoming more popular, as are convertible tablets, and some UMPCs have QWERTY keys on either side of the display.

As yet, UMPCs are still relatively niche, but several prominent notebook vendors have thrown their hat into the ring, including Sony, ASUS, Samsung and Fujitsu. The latest units all ship with Windows Vista, which is good if you like having the latest operating system, but not so good if you want decent performance.

Anyone that's tried to run Vista on an under-powered notebook will appreciate just how resource-hungry Microsoft's latest operating system is, and on a system with 1GB or less of RAM and a Celeron M or Pentium M processor — the typical spec for a UMPC — the experience borders on intolerable. Eventually, dual-core chipsets will make their way into UMPCs, as they come down in size and price, but, in the meantime, the extra mobility these devices offer comes with a sting in the tail by way of sluggish performance.

Battery life is another issue that plagues the current crop of UMPCs. While you can find many ultraportable notebooks that offer a run-time that's upwards of six hours, UMPCs struggle to make the three-hour mark — in most cases, even two hours is unattainable. This makes them suitable for quick trips out of the office but not for extended use — unless you've got ready access to a power outlet.

Palm Treo 500v

Interestingly, the biggest innovation we've seen for Windows Mobile in the last three years has come from Microsoft's partners rather than the big M itself. HTC is probably the most notable in this regard, with the TouchFLO enhancements added to its Touch smartphone, but Palm has also been quite liberal in adding tweaks and GUI modifications to its Windows Mobile-based Treo phones.

However the 500v's secret sauce — an overhauled menu system that's controlled from the standby screen — comes from Vodafone. Dubbed with the decidedly unsexy moniker of 'Terminal Platform Program' (TPP), it's a welcome change from the bland Windows Mobile 6 Standard interface.

Programs and options are grouped together on a horizontal axis that you scroll through using the 500v's five-way direction pad, making it much faster to jump between multimedia, programs, messaging, PIM and settings.

The 500v's Treo heritage is apparent but it's a lot more streamlined than previous models, with function keys that are flush with the casing, a wide-aspect 2.4in display and a slimmer chassis that feels great in the hand.

Sadly, the software enhancements we've come to love in Windows Mobile-based Treos (such as the threaded SMS and photo dialling) are missing on the 500v, and mobile data junkies will be disappointed with the lack of HSDPA and Wi-Fi.

BlackBerry Curve 8310

Vodafone's take on the BlackBerry Curve adds GPS to the mix, using the telco's newly launched Compass service. Apart from that, this device has identical specs to the original Curve, including quad-band 850/900/1800/1900 GSM/GPRS/EDGE, Bluetooth 2.0, microSD expansion and a two-megapixel camera.

Vodafone Compass is a service that transfers Australia-wide maps over the network on-the-fly. Prices start at $2.50 for a day pass, and the annual subscription is a reasonable $79 a year. Most of the basic navigational features are supported, including car and pedestrian modes, a Points of Interest database and a choice between maps and text directions.

But the service is just as easily characterised by the features it doesn't have. At time of writing, 3D map display, multiple waypoints, assisted GPS and contacts integration were still missing, but a Vodafone spokesperson claimed these would all be rolled into future updates to the service.

Of course, the BlackBerry's key strength is its email functionality, which, when combined with an excellent thumbboard, makes the Curve an exceptionally potent little communicator. It's not as full-featured as on some other smartphones, but the remarkably fuss-free email experience makes the lack of frills forgivable. Plus, the Curve has stellar battery life, scoring eight hours of video playback in our run-down test. This should equate to roughly four days of medium-to-heavy real-world usage.

O2 Xda Flame

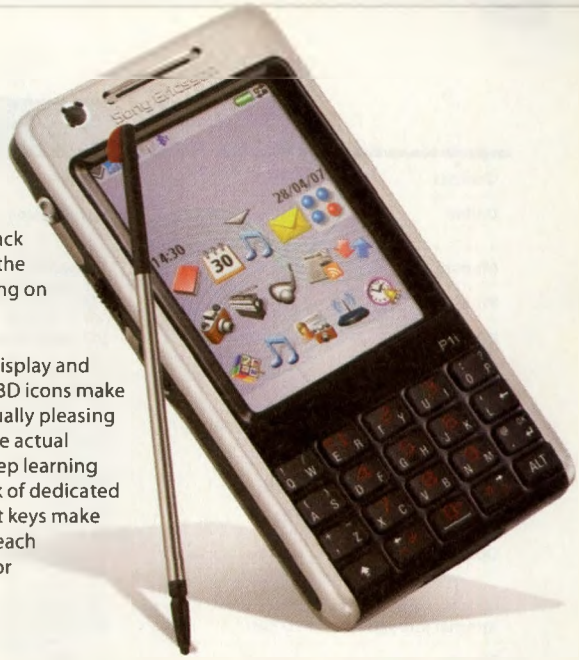
The Xda Flame's generous dimensions are a throwback to the original Xda smartphones of five years ago, minus the awkward antenna. This form factor has largely been superseded by smaller, more pocket-friendly designs, but there are perks to having such a spacious screen. On the Flame's 3.6in VGA-resolution display, you can view more of Word documents, Excel spreadsheets and web pages, and video playback looks fantastic.

A bigger footprint also allows for more features, and O2 hasn't been shy about cramming those in. The Flame is the first Windows Mobile handset we've seen that supports USB On The Go, which lets you connect flash drives to the device using a supplied adapter. We'd have preferred the full USB slot on-board, given the ample room available, but it's nevertheless a great feature for transferring files to and from the Flame without a PC.

Other features include composite TV out, 2GB of storage (as well as microSD expansion), an infra-red remote control application, built-in FM radio and an Nvidia GoForce 5500 3D Hardware Accelerator for boosting video and gaming performance.

The latter is a tad gimmicky — the only game that supports it is the included Siege: Catapult Assault, and Windows Media Player Mobile is already optimised for video playback using the standard ARM, Samsung and TI processors.

Sony Ericsson P1i



QWERTY thumbboards are great for writing messages, but they invariably make a smartphone wider than a standard handset. Sony Ericsson has tried to combat this problem by assigning a letter to the left and right side of each key. A great idea in theory, but in practice it's error-prone and difficult to use. Ironically, the P1i isn't exceptionally narrower than other thumbboard-equipped smartphones.

The P1i continues the trend of previous P-series models by running the Symbian UIQ operating system, and thankfully it's the newer 3.1 version that irons out most of the kinks of the previous firmware.

Ample applications are on-board, including QuickOffice for editing Word and Excel documents, PDF+ for viewing and editing PDF files, a business card scanner and Exchange ActiveSync for synchronising with a Microsoft Exchange mail server.

Navigating through the menu is accomplished by using the scrollwheel and back key on the side of the device or by tapping on the 2.6in QVGA touchscreen.

The rich 262k display and brightly coloured 3D icons make using the P1i a visually pleasing experience, but the actual interface has a steep learning curve, and the lack of dedicated call buttons or soft keys make moving between each new task a three- or four-tap process.

Fujitsu Lifebook U1010

Affectionately dubbed 'the Stormtrooper' due to its distinctive black-on-white colouring, the LifeBook U1010 is the first UMPC to use a convertible tablet design. As far as input goes, having a keyboard built-in is more convenient than fussing around with the stylus, but you're better off using it as an over-sized thumbboard, as the keys are too small for touch-typing.

We're sure that Intel had a grand vision when launching the Intel Ultra Mobile Platform 2007 — a chipset designed specifically for Mobile Internet Devices and UMPCs — but pairing it with Vista (in this case Home Premium) seems a poor choice. The U1010's 800MHz A110 processor coped with having one application open at a time, but it struggled with multi-tasking and even launching a Flash-heavy web site would consume most of the system's resources.

Fujitsu has opted for an ultra-high 1,024 x 600-pixel resolution for the 5.6in screen, which has its good sides and bad. On the plus side, text and images are incredibly sharp, and you can use most applications and web sites without having to pan around the screen.

The downside is that working at such a high resolution becomes a strain on the eyes, and there's no option to lower it to a more comfortable pixel count.

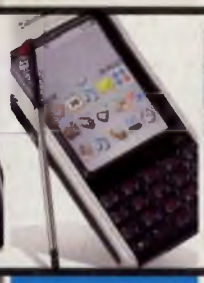
Pioneer Dreambook Ultra Mobile PC 650

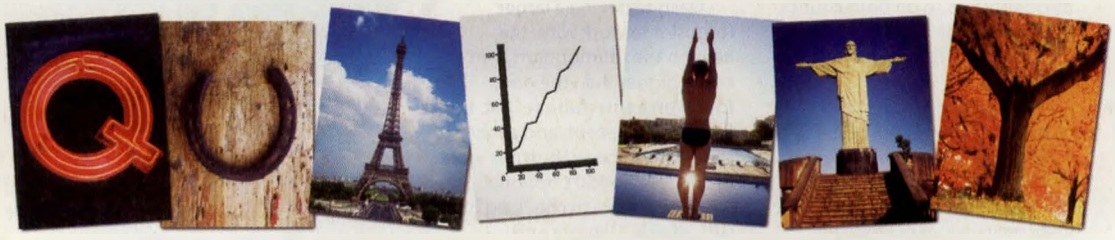
The DreamBook Ultra Mobile PC 650 crashed mid-way through the Crystal Mark benchmark program (as well as the first battery run-down test), which doesn't speak highly of its stability. Its form factor resembles that of a larger OQO 02 (reviewed in *APC* September, page 37), with a glossy-black front panel that slides up to reveal a split QWERTY keyboard.

While the OQO 02 is slickly presented and solidly constructed, however, the DreamBook 650 is decidedly less so on both counts. Then again, the OQO 02 is almost double the price, so you get what you pay for.

The 650 can be spec'd any number of ways — our test configuration came with a 1GHz Via C7M processor and 704MB of RAM. Needless to say, running Vista on it was an exercise in patience — at the very least you should plump for the 1GB memory upgrade.

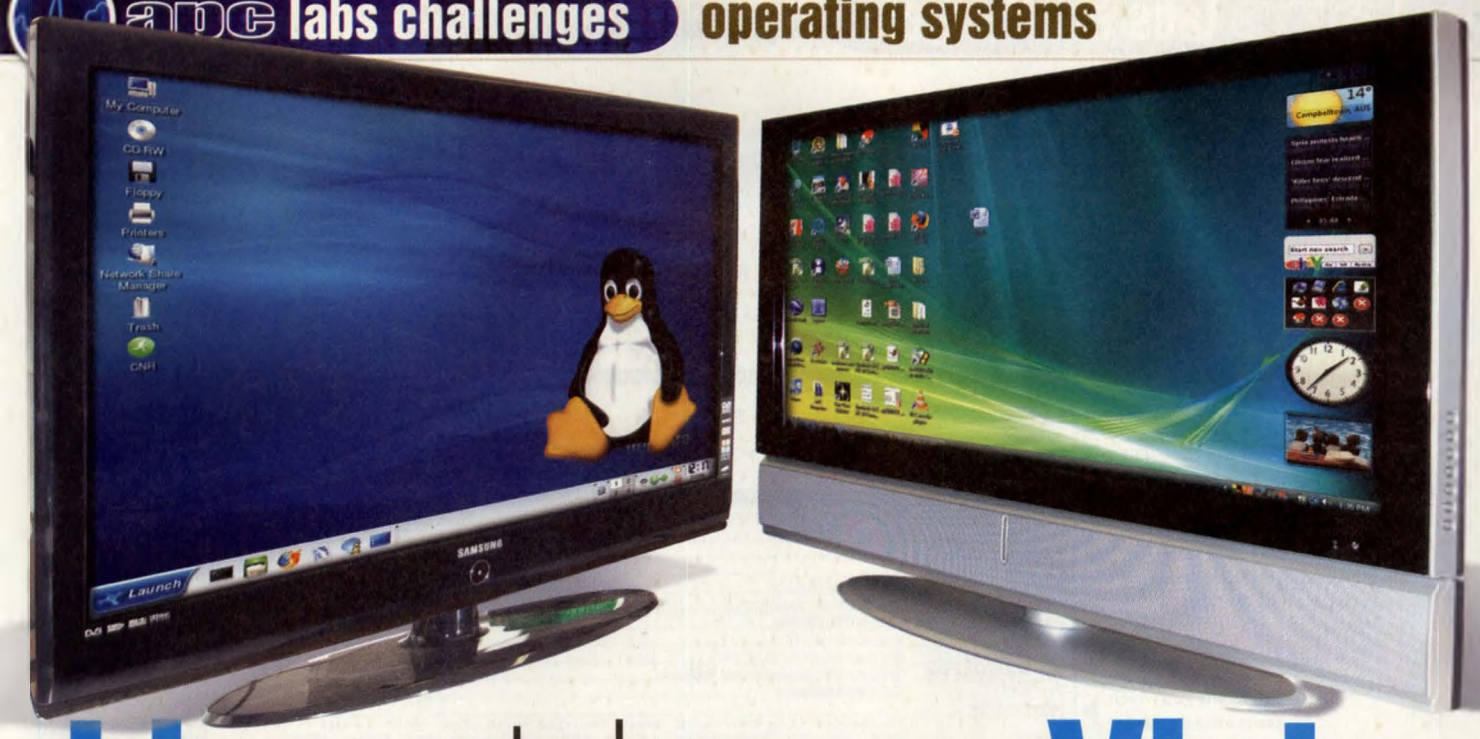
Despite having a larger footprint to work with, the keys on the thumbboard aren't much bigger than the ones found on a smartphone. But, tactile feedback is decent, and all the standard keyboard buttons are included. The 650's optional features are worth checking out: GPS, digital TV tuner and integrated WWAN.

	PALM TREO 500V	BLACKBERRY CURVE 8310	O2 XDA FLAME	SONY ERICSSON P1i	PIONEER DREAMBOOK 650	FUJITSU LIFEBOOK U1010
Contact	Palm	Vodafone	O2	Sony Ericsson	Pioneer Computers	Fujitsu
Online	www.palm.com	www.vodafone.com.au	www.o2.com.au	www.sonyericsson.com	www.pioneercomputers.com.au	www.fujitsu.com
Market	Everyone	Everyone	Everyone	Everyone	Everyone	Everyone
Price	TBA	$749	$1,499	$1,099	$1,399	$1,899
Dimensions	110 x 62 x 17mm	107 x 60 x 15.5mm	126 x 74 x 17.5mm	106 x 55 x 17mm	190 x 120.8 x 28.3mm	171 x 133 x 32mm
Weight	120g	111.4g	190g	124g	720g	600g
Network Modes	Tri-band GSM/GPRS; 3G	Quad-band GSM/GPRS/EDG	Tri-band GSM/GPRS, 3G	Tri-band GSM/GPRS; 3G	1GHz Via C7M	800MHz Intel A110
Talk Time / Battery	4.5 hours	4 hours	2.5 hours	3.5 hours	2.5 hours	1.5 hours
Standby time	10 days	17 days	7 days	10 days	N/A	N/A
Operating system	Windows Mobile 6 Standard	BlackBerry 4.2.2	Windows Mobile 5 Pocket PC Phone Edition	UIQ 3.1	Windows Vista Home Premium	Windows Vista Home Premium
Internal storage	150MB	64MB	2GB + 128MB	160MB	30GB	40GB
Memory expansion	microSD	microSD	microSD	Memory Stick Pro Duo	N/A	N/A
Wireless	Bluetooth 2.0	Bluetooth 2.0	802.11b/g WLAN; Bluetooth 2.0	802.11b WLAN; Bluetooth 2.0	802.11b/g WLAN	802.11b/g WLAN; Bluetooth 2.0
Screen	2.4in, 320 x 240	2.5in; 320 x 240	3.6in; 480 x 640	2.6in; 240 x 320	6.5in; 800 x 480	5.6in; 1,024 x 600
Ports	N/A	N/A	N/A	N/A	2 x USB 2.0; docking connector; SD card reader; headphone jack; microphone; VGA	USB 2.0; docking connector; SD card slot; CF card slot; headphone jack; microphone
	apc Highly Recommended	apc Editor's Choice				
						
✔	Enhanced menu system; attractive form factor.	Excellent thumbboard; compact; GPS.	USB On The Go; TV out; 2GB storage.	Attractive design; long battery life.	Affordable; built-in thumbboard.	Compact; dual memory card slots.
✖	No HSDPA; no Wi-Fi.	Limited third-party applications.	Expensive; bulky; no HSDPA.	Fiddly thumbboard; confusing interface.	Slow; unstable; poor build quality.	Slow; mediocre battery life; high resolution.
Verdict	★★★★☆	★★★★½	★★★½☆	★★★☆☆	★★½☆☆	★★★½☆



EPSON
EXCEED YOUR VISION

GENUINE EPSON INKS AND PAPER



Linux takes on Vista

With Vista take-up slowing down and claims that users are underwhelmed by what it offers, Linux is stepping out. *Andrew Sutcliffe* puts the OS to the test.

Windows Vista is expensive and XP is old. Linux, however, is in a constant state of development and improvement. There's also myriad different versions — and happily a lot of them are free. But you can't deny that Microsoft's relations with the industry keeps Windows ahead of the technology game, or can you?

It's time to compare Linux features and see what really comes out on top. Can some of the most popular distros do as much as Windows 'out of the box'? Where they're lacking, we'll look at support. And we'll tell you whether the money for Windows is worth it, or whether you're better off with a free operating system.

Most people know what Linux is — there's been countless column inches devoted to its history, but it's the present we're more interested in. Recently, distros have claimed to be more user-friendly and, ironically, part of this seems to have occurred through coders and companies taking a leaf out of Microsoft's book. The installation process is a prime example.

INSTALLATION

No longer is it a daunting and risky process to install a Linux distro — even if you're planning to dual-boot a Windows-based box. Many flavours of Linux claiming to be user-friendly come with a graphical installer, rather than the scary-looking command-line interfaces of yesteryear. You'll still need to use a partitioning tool, though (and when dual-booting, chances are that you'll have to set manual rather than automatic options). But that's no disaster — just remember that Linux doesn't use NTFS (the

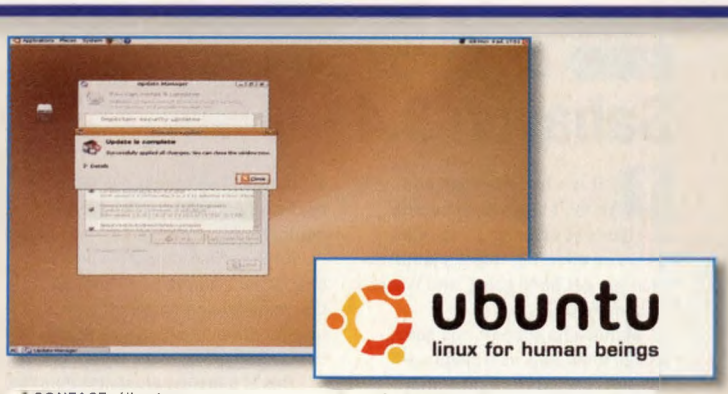
HOME OFFICE LINUX

Ubuntu 7.0.4

Dell recently announced that Ubuntu would be their choice to supply with new PCs, which was a surprise to some. It's not an unreasonable one, though. Ubuntu is easy to use, due to the Live CD which can be used as an install CD.

This new version also features an application for managing third party drivers (such as for an ATI graphics card). That meant that installation of the driver went well, but didn't work out of the box. MP3 isn't supported out of the box either, but support is very easy to come by on the web, and you can also pay for support from the company which is behind Ubuntu, Canonical.

Games and multimedia performance was pretty average, and there were other annoyances, like not being able to get our network hard drive properly installed, despite following the instructions. This is a great home-office OS, which sticks staunchly to open source principles.



CONTACT Ubuntu
ONLINE www.ubuntu.com
MARKET Everyone
PRICE Free

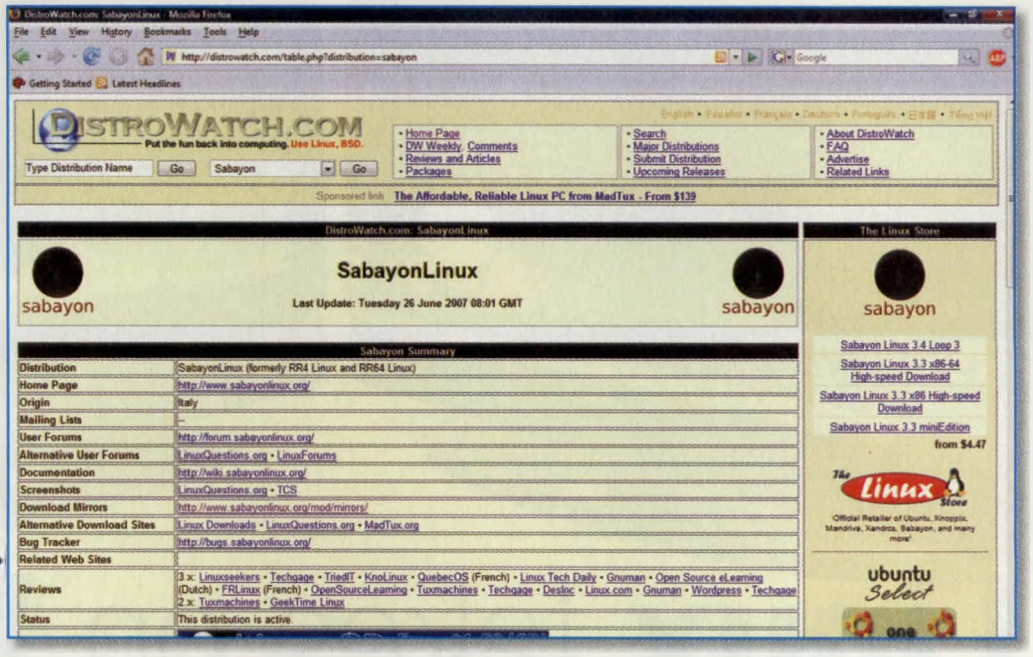
✔ Installable Live CD; good support.

VERDICT ★★★½☆

✖ Poor games and multimedia.

HOW WE TESTED

We tested the operating systems on everyday, real-world tasks: playing games, emailing and browsing the internet, producing documents, listening to music or working with photos. All of these are tasks which Windows makes pretty easy. Linux is capable of all of them, but how easy are they to get to grips with? Which programs are used and why? And which performs the best 'out of the box'? These are the questions we will answer, and, in doing so, we'll find the best Linux OS around and compare it to Windows XP and Vista.


DistroWatch.com: SabayonLinux - Mozilla Firefox
http://distrowatch.com/table.php?distribution=sabayon
DISTROWATCH.COM
Put the fun back into computing. Use Linux, BSD.
Home Page
DW Weekly, Comments
Reviews and Articles
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Advertise
Related Links
Sponsored link: The Affordable, Reliable Linux PC from MadTux - From $139
DistroWatch.com: SabayonLinux
SabayonLinux
Last Update: Tuesday 26 June 2007 08:01 GMT
Sabayon Summary
Distribution: SabayonLinux (formerly RR4 Linux and RR64 Linux)
Home Page: http://www.sabayonlinux.org/
Origin: Italy
Mailing Lists: -
User Forums: http://forum.sabayonlinux.org/
Alternative User Forums: LinuxQuestions.org • LinuxForums
Documentation: http://wiki.sabayonlinux.org/
Screenshots: LinuxQuestions.org • TCS
Download Mirrors: http://www.sabayonlinux.org/mod/mirrors/
Alternative Download Sites: Linux Downloads • LinuxQuestions.org • MadTux.org
Bug Tracker: http://bugs.sabayonlinux.org/
Related Web Sites
Reviews: 3.x: Linuxseekers • Techgage • TriedIT • KnoLinux • QuebecOS (French) • Linux Tech Daily • Gnuman • Open Source eLearning (Dutch) • FRLinux (French) • OpenSourceLearning • Tuxmachines • Techgage • Desinc • Linux.com • Gnuman • Wordpress • Techgage 2.x: Tuxmachines • GeekTime Linux
Status: This distribution is active.
The Linux Store
Sabayon Linux 3.4 Loop 3
Sabayon Linux 3.3 x86-64 High-speed Download
Sabayon Linux 3.3 x86 High-speed Download
Sabayon Linux 3.3 miniEdition
from $4.47
ubuntu Select one

Distrowatch tells you which are the most popular downloads and where you can find them.

filing system actually varies between distros). You'll also need to have a partition formatted as 'swap' in some cases.

Linux has come a long way — not quite as far as Windows though, but, if you're not dual-booting (a feature you won't find when installing Windows), the process is much simpler. So, things may not be perfect yet. But is Windows perfect? (And is it ever likely to be?) Two very pertinent questions. Not all installation routines are the same, though, and the one you get depends upon the version of Linux that you choose.

But what could possibly be exciting about an OS? It's a fair question, and the best way to answer this is to state that when you install a Linux distro, you don't just get the opportunity to spend yet more money on office suites, image editors and security software: you get everything all together. In a lot of cases, you even get it all on one CD — that's CD, not DVD; so your only expenses come from finding and downloading the ISO, then burning it to a blank disc. Sabayon is an exception to this, as it weighs in at over 4GB.

Many of the newest and most popular distros, including several of the ones we tested, feature an ingenious 'try before you install' system. This is based on the download ISO creating a Live CD, which can then be used as an install CD as and when required. The concept of a Live CD is not new. Put simply, it gives you the chance to use a distro without installing it to your hard drive. So, you boot straight into the OS from the CD and bypass Windows altogether, although critics have pointed out that this can be quite a slow way to try Linux.

In years gone by, the Live version has been a different ISO from the Install version. In the case of Ubuntu and several others, this has now changed. Once the CD image is downloaded and burned to disc, you can boot straight into Ubuntu's GNOME desktop and start using the OS as a Live CD. If you like what you're seeing, you can simply install the OS from the same disc. It's simple, very effective, and free.

GUI APPEAL

The practicalities of the installation were also important in our tests. That could mean anything from how easy the installer is to use to how pleasant the desktop is. As we mentioned, we've gone for a variety of different desktops with GNOME and KDE-based distros. With Sabayon, we have something extra in the form of Beryl.

This particular desktop window manager has the potential to make

LINUX FOR GAMERS

Sabayon 3.4

on the DVD

This is a big download and doesn't seem to come with four times as much as some of the others on offer. But it looks fantastic once you get Beryl going, and is a fast, responsive OS.

Multimedia support was good, though it did take us a couple of attempts to find the right source of graphics driver info. Sabayon is constantly being updated – we tested version 3.4 Loop 3a and technical support isn't as readily available as the other distros – though it is out there.

All the office support is present, but, if that's all you want from an OS, you might be better off with a smaller download, because Beryl can be buggy.

This is more experimental than the other distros, but if you're looking for something fresh and exciting, this will certainly fit the bill.

CONTACT	Sabayonlinux
ONLINE	www.sabayonlinux.org
MARKET	Everyone
PRICE	Free

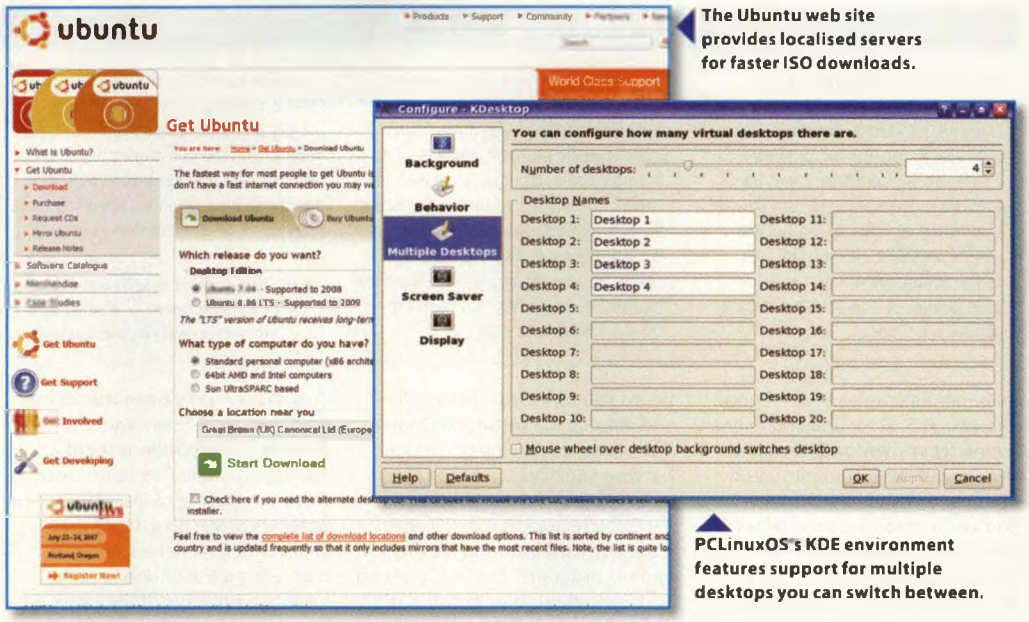
✔ Comprehensive package; fast.

VERDICT ★★★★☆

✖ Enormous download size.

HANDY TIP

The 'sudo' or 'su' console commands give you temporary root (administrator) permissions so you can install software without logging out. Don't be fooled if asterisks don't appear on screen when typing in the password – your key strokes are registering but there's no graphical representation.



The Ubuntu web site provides localised servers for faster ISO downloads.

PCLinuxOS's KDE environment features support for multiple desktops you can switch between.

Vista's fantastic Aero effects look old hat before most people have even seen them. It's a very new project (it was announced in September 2006) and is currently only up to version 0.2.0 — and as such it can be a bit buggy. However, the effects are genuinely impressive. Desktop cubes have been done before on Windows XP in programs such as Yodm3D (**http://chsalmon.club.fr/index.php?en**) but Beryl goes further by adding some impressive pull and stretch effects to give 'wobbly windows'. You may think these could be a distraction —in reality, you'll experiment with dragging windows around a lot to begin with, but it'll soon become second nature without being distracting.

WINDOWS WANNABES

By selecting five different types of Linux, we still have a variety to focus on that are designed for the home user. One obvious omission from the testing is Fedora Core 7; it's unfortunate that it couldn't be included, but there are literally dozens of other distros that have suffered the same fate.

Many would say Ubuntu has been much more popular than Fedora Core 7. Working under the idea of 'Linux for human beings', Ubuntu then gets each release's name from an animal: Hoary Hedgehog and Edgy Eft being two recent examples. You can download the latest version from **www.ubuntu.com**. At the time of writing, this is 7.04, based on the GNOME desktop environment. Three other flavours of Ubuntu are also available. Kubuntu is based on the KDE desktop environment, Edubuntu is aimed at schools and Xubuntu is designed for low-spec PCs.

Another reasonably new distro is PCLinuxOS (**www.pclinuxos.com**), which first appeared in 2003. This has been designed with Windows users in mind, and as such is based on the KDE desktop (which is more like Windows in appearance than GNOME). The 2007 release arrived in May and we're going to test this version. The operating system is based on another popular distro called Mandriva, which is why we didn't include it in this test.

Freespire (**www.freespire.org**) is based on the commercial Linspire and aimed at Windows users. Originally, Linspire was called LindowsOS, but Microsoft sued on the grounds of trademark infringement. MS lost and so sought a re-trial, but settled before this happened. Freespire is the community-driven open source project that came out of Linspire — the first betas of this Debian-based OS appeared in mid-2006.

Sabayon and openSUSE are our two remaining candidates. The Italian Sabayon is a real newcomer and is based on Gentoo Linux. Both OSs come on a DVD-sized ISO, so you'll be looking at around 4GB of download if you choose either the Italian distro or openSUSE, which is an open source OS based on the commercial SUSE — a German Linux distro based on Slackware.

To get hold of Sabayon, go to **www.sabayonlinux.org** and for openSUSE, **www.opensuse.org**. We suggest you use a download

BEST FOR LINUX NEWCOMERS

Freespire

on the DVD

We used a beta version for testing (as Freespire 2 had not been completed at the time of writing) which called itself 1.9.0. Freespire installs quickly and is easy to use.

The KDE environment will feel familiar for Windows users, and support for most multimedia, including MP3, is included out of the box. It even mounted our Windows XP partition with both read and write access on first boot-up.

It does tend to use older software to ensure maximum stability and compatibility, and there's always that feeling that you're missing out. We could say that Freespire is a match for Windows XP, but it can't beat Vista for this very reason.

We're very impressed with Freespire, and support is available through a lively community. It may not be as big as Ubuntu, but it has the potential to expand on the good work that's been done so far.

CONTACT Freespire
ONLINE www.freespire.org
MARKET Everyone
PRICE Free

✔ Fast installation; performance.

VERDICT ★★★★☆

✖ Older software no match for Vista.

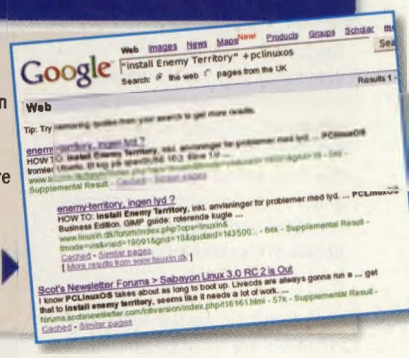
GETTING HELP WITH LINUX

The wonderful thing about the internet is that it's indescribably vast. There's a lot of stuff out there, but when you're looking for an answer to a very specific problem, it can be somewhat overwhelming. But getting help with your Linux distro (as you almost certainly will need to, just as you probably did when you first tried Windows) doesn't have to be a painful experience.

The first port of call for general assistance should be the homepage of the distro you're using. If you have a more specific problem, you'll need to fire up Google. Use quotes to look for specific phrases, and remember to use the relevant information. For example, if it's a hardware issue, use the model name. So, you might put something like this in the search box: 'no sound in Quake 4 in Ubuntu 7.04'.

Being specific is the key, whether forums or Google. The answers are usually already there, so you won't even need to join the community forums. Don't be afraid to get involved though: newcomers' experiences are often more relevant to developers than veterans'.

Using the correct search terms will get you help faster — and will be more relevant to your system.


Google
"install Enemy Territory" +pclinuxos
Web
enemy-territory, ingen lyd ?
HOW TO: Install Enemy Territory, inkl. anvisninger for problemer med lyd. ... PCLinuxOS
Scot's Newsletter Forums > Sabayon Linux 3.0 RC 2 is Out
I know PCLinuxOS takes about as long to boot up. Livecds are always gonna run a ... get that to install enemy territory, seems like it needs a lot of work. ...

manager for convenience. A good choice is Free Download Manager (**www.freedownloadmanager.org**), if you're downloading from Windows — it's freeware. Once you've downloaded your ISO of choice, burn it to CD or DVD and — if you're planning on checking out more than one distro — it's much more efficient to use a rewritable disc.

You'll then need disc-burning software such as Nero or the freeware Active@ ISO Burner (**www.ntfs.com/iso-burning.htm**) to pop the ISO onto the disc. Try to slow the writing speed down here. It might take a little bit longer, but it reduces the likelihood of errors on the disc. Once burned, reboot your PC and adjust the BIOS settings to have your optical drive as the first boot device. Your Linux disc will then boot, either into an installer or a Live CD environment, depending on what you went for.

If you have both on-board sound and a dedicated soundcard, a good tip is to disable the one you don't use. That's likely to be the on-board sound, so go into the BIOS and change the setting to Disabled. This saves you having to choose between devices once the OS is installed and makes things easier.

If you're using a Live CD, use it to have a look around for the various programs, but don't rely on it for long though — install it as soon as you can. You won't even need a huge amount of space to start with — a partition of around 20GB will be fine to start with. If you decide to ditch Windows altogether, you can worry about that later, as Linux will install alongside.

> THE WHOLE IDEA BEHIND OPEN SOURCE IS THAT CODE CAN BE DISTRIBUTED, CHANGED, RE-USED AND ADAPTED FREE OF CHARGE

OUT-OF-THE-BOX SUPPORT

Those who are nervous about trying Linux are often worried that their hardware won't work, or that things will be difficult to set up. This has certainly been true in the past. Just three years ago, your humble correspondent spent a combined total of six hours over three days trying to install a graphics driver on a distro that shall remain nameless. Such hair-tearing frustration isn't the exclusive preserve of the Linux user, however, as Windows has its share of gremlins too. But something as simple as installing a driver is easy in Windows, and shouldn't be difficult in Linux.

Listening to music can be difficult with Linux. The problem with digital music is that the majority is MP3. It's not an open source technology and as such, it's open to licensing costs and potential legal pitfalls. This has proved to be the case, with companies claiming to own various patents, including Thomson Consumer Electronics.

The whole idea behind open source software is that code can be distributed, changed, re-used and adapted free of charge, patents and copyright. So, a technology which requires licensing splits the Linux community into the people who don't want anything to do with it (because it goes against the philosophy) and the ones who are willing to include support as it makes using a computer that bit easier.

The upshot of all of this is that several distros do not support MP3 out of the box, so the user has to find out how to set up playback themselves. Previously, this has been tricky, but Ubuntu, for example, now includes a way to get MP3 support more easily,

SLIM-LINE LINUX

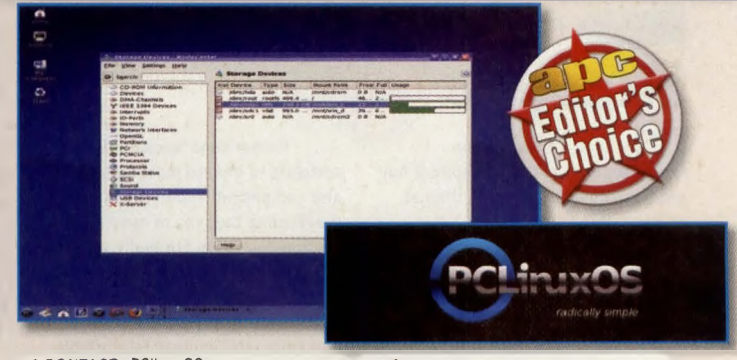
PCLinuxOS 2007

Another KDE-based OS, this feels very similar to Freespire and is just as impressive. The out-of-the-box performance was just fantastic, supporting music and videos, finding all our devices and mounting the Windows partition and our USB flash drive.

It offers a working 'back' button on our mouse – something we're not used to in Linux and a very welcome change from the norm. The OS did feel slightly sluggish at startup (Freespire was too, so it could be a KDE issue).

The software packages aren't plentiful, but it caters for most user's office and multimedia needs. That's probably because the ISO is reasonably small. The selection of programs that are included are organised well in the menus.

This isn't an OS for programmers or power users – but it's difficult to see how it could be better for the Linux newcomer.



.: CONTACT PClinuxOS
.: ONLINE www.pclinuxos.com
.: MARKET Everyone
.: PRICE Free

✔ Best out-of-the-box performance.

.: VERDICT ★★★★½

✖ Sluggish on startup.

HANDY TIP

Older games might not work with new Linux distros because they don't support the new ALSA sound driver. Google is your friend, though, as sound problems are not uncommon and help is out there.

HANDY TIP

If the partition manager tells you to assign a swap partition during installation, follow this advice, because not having one can seriously hinder performance.

without it working out of the box. Some distros — such as Freespire — will play MP3 music without any further set up beyond standard installation.

It's a difficult situation because it's essentially an ethical dilemma — and it doesn't end with MP3s. All formats that are owned by third parties or are protected by licensing laws are subject to this same scrutiny. That includes certain video formats, other music files and, to an extent, ATI graphics drivers.

In August 2006, days after Intel announced it would release open source drivers for its own graphics chips, an ATI statement was released. In it, the company (which had not been taken over by AMD at this point) announced:

"Proprietary, patented optimisations are part of the value we provide to our customers and we have no plans to release these drivers to open source."

ATI does develop and distribute a proprietary Linux driver, but it's not open source, because some of the technologies in the driver are covered by NDAs (non-disclosure agreements) with other companies. Until that changes, out-of-the-box support for ATI graphics cards will remain a difficult issue. Our test machine was intentionally fitted with an ATI-based graphics card so we could specifically test how each OS coped with this particular hardware requirement.

Another, less-obvious test we wanted to include involves the mounting of partitions. A system that dual-boots with Windows will probably need to be able to see the files stored on the Windows partition. If the volume is not mounted, this isn't possible. And not all distros do this automatically, so you might find it a hassle to simply open files you already have.

Storage then is an important issue, especially if the partition needs to be mounted manually. An automatically mounted Windows partition deserves considerable brownie points because this is something Windows won't do automatically at all. We also wanted to know if the OS can see our network hard drive, which claims to be compatible with Linux.

Another storage-based test (and something Windows users take for granted) is the way an OS treats a USB flash drive. In theory, the user should be granted both read and write permissions with no questions asked, so this is worthwhile because of how important flash drives are.

BEYOND THE OS

The overall package — that is, what do you get in terms of office suite, media players and 'is there anything obvious missing?' — needs to be judged and, because Linux is always evolving, this is one of the things you need be least concerned about. OpenOffice may not be a rival to Microsoft Office 2007 in terms of visuals, but you can certainly use it on a day-to-day basis for producing documents.

We're undecided on whether having such a common core of programs or packages is a good thing. It certainly leads to popularity and compatibility, but this shouldn't lead to complacency. Hopefully things remain that way for years to come.

For context, Windows XP would get four out of five, while Vista would get four and a half (Home Premium and Ultimate versions) in our tests. You need to choose if you want support (but the extra costs of Windows) or the low-cost bleeding-edge world of Linux — you could go for both and dual-boot.

TRIED-AND-TESTED LINUX

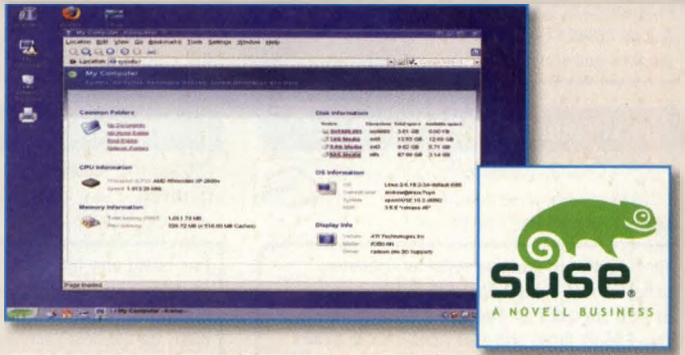
openSUSE 10.2

This OS is big – it comes on either five CD ISOs or one DVD. By the time openSUSE came about, SUSE Linux was already up to version 10 in 2005. This is a community project sponsored by Novell, so support is very good.

It's impressive: you can use KDE or GNOME desktop environments and, as you've probably realised, we think KDE is best for Windows users.

openSUSE is old school, so there's no out-of-the-box support for formats such as MP3. It's the same story with ATI graphics drivers – and Nvidia. The openSUSE web site's advice? 'Consider the use of a graphics adapter with full support for Linux and F/LOSS software, such as from Intel'.

As impressed as we were by openSUSE, it's slightly lacking. This is entirely because of their admirable ethical/legal standpoint and not because this is a poor operating system. It isn't.



CONTACT OpenSUSE
ONLINE www.opensuse.org
MARKET Everyone
PRICE Free

✔ Comprehensive package bundle.

VERDICT ★★★½☆

✖ No ATI graphics or MP3 support.

BEST TECH

APC's independent reviewers point to the best technologies in the top-selling product categories each month. We only change products when a better one comes along. What you see here is the best technology available on the market.

BEST VALUE

The **Best Value** award is for products which offer a good combination of features for a reasonable price.

BEST OVERALL

The **Best Overall** award is for products we believe are the best, regardless of price.

DESKTOP PCs – GENERAL USE

Enspire Vitesse XP2

.: CONTACT Enspire Digital
.: ONLINE www.enspiredigital.com.au
.: PRICE $2,899

This is an excellent do-everything PC with Intel's new P35 chipset, Core 2 Duo E6700, 2GB of high-performance DDR2-800 memory and Nvidia GeForce 8800 GTS graphics. You get a 500GB SATA II drive and a big Samsung 205BW 20in wide-screen LCD with a TV tuner. A good mix of CPU grunt, graphics and storage.

Altech Sputnik

.: CONTACT Altech Computers
.: ONLINE www.altech.com.au
.: PRICE $1,499

The Sputnik has great potential for upgrades; using the P35 chipset, the sky's the limit as far as CPU upgrades go. The CPU is an Intel Core 2 Duo E6600, fitted with 1GB Corsair Value Select DDR2-667 RAM. It cuts it a little fine for Vista, but it has Windows XP Pro SP2. You also get an Nvidia GeForce 8500GT.

MOTHERBOARDS

GigabyteP35T-DQ6

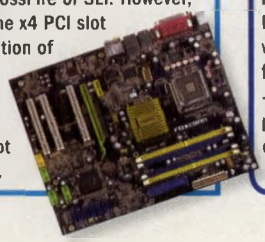
.: CONTACT Gigabyte
.: ONLINE www.gigabyte.com.au
.: PRICE $439

A solid-performing board to support the Intel 1,333MHz frontside bus Core 2 Duo and Core 2 Quad CPUs. Supports up to four modules of DDR3 and eight SATA drives plus has some legacy connectors for older hardware. Also, two x16 slots for CrossFire and three PCI Express x1 ports.

Foxconn P9657AA-8KS2H

.: CONTACT Foxconn
.: ONLINE www.foxconnchannel.com
.: PRICE $165

This board only has a single x16 PCI Express slot, so it can't be used for CrossFire or SLI. However, it also has one x1 and one x4 PCI slot ready for the next generation of PCI-E expansion cards. Combine this with HD audio, five SATA and one eSATA port and you've got top value for your money.



SMARTPHONES

Blackberry Curve 8310

.: CONTACT Vodafone
.: ONLINE www.vodafone.com.au
.: PRICE $749

Vodafone's take on the BlackBerry Curve adds GPS to the mix, using the telco's newly launched Compass service. Apart from that, this device has identical specs to the original Curve, including quad-band, Bluetooth 2.0, microSD expansion and 2MP camera. No 3G or HSDPA though.

NEW ENTRY

Nokia E61

.: CONTACT Nokia
.: ONLINE www.nokia.com.au
.: PRICE $749

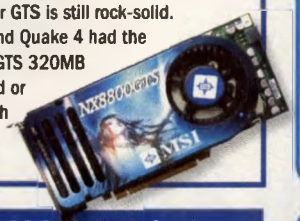
It's hard to fault Nokia's 3G 'BlackBerry Killer': it has the comfortable BlackBerry form factor along with a QWERTY keyboard and fits comfortably in your pocket – plus, you can take your pick of push email service. There are two other killer features: inbuilt Wi-Fi and Nokia's new web browser.

VIDEO CARDS

MSI GeForce 8800 GTS 320MB

.: CONTACT MSI
.: ONLINE www.msicomputer.com.au
.: PRICE $479

There is a pretty big difference between the GTX and the GTS models on paper, but the performance of the much cheaper GTS is still rock-solid. Testing in F.E.A.R. and Quake 4 had the card singing – the GTS 320MB version never slowed or shuddered, even with the system-killing 16xAA turned on.



Palit HD 2600 PRO 256MB Sonic

.: CONTACT Palit
.: ONLINE www.palit.biz
.: PRICE $149

For such a cheap card, this has decent performance, scoring 4,141 in our 3DMark06 benchtest at a resolution of 1,280 x 1,024. While the XT versions are more aimed at the casual gamer, the PRO offering from Palit gives us native HDMI and a shortened length, making it the perfect companion for a home theatre PC.

SERVERS – SMALL BUSINESS

PowerEdge 2900

.: CONTACT Dell
.: ONLINE www.dell.com.au
.: PRICE From $3,487

This Dell is a beauty. It's dual-socket, dual-core and sports up to two of the new Intel Woodcrest Xeons. The default config features a single Xeon 5140 at 2.33GHz with 1,333MHz FSB, backed by 2GB of DDR2 533 FB DIMMS and an 80GB SATA II hard drive. Dell offers a 3-year on-site warranty on this hugely upgradable server.

HP ProLiant ML110 G3 SMB Bundle

.: CONTACT HP
.: ONLINE www.hp.com.au
.: PRICE $1,499

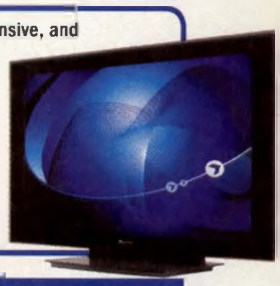
Not a real powerhouse, but the price can't be beaten. This unit is a single CPU Pentium 4 3.0GHz with 1GB of RAM and two 80GB hard disk drives. Though it won't break any speed records, it will suit a small business's needs. The server is bundled with Microsoft Small Business Server 2003 Standard Edition.

HD DISPLAYS

Pioneer PDP-5000EX 1080p

.: CONTACT Pioneer
.: ONLINE www.pioneer.com.au
.: PRICE $10,999

It's massive, ludicrously expensive, and has possibly one of the best pictures we've seen. Fast-moving images stay crystal clear, and don't be fooled by the picture in the shops – with the lights out, the contrast and definition are second to none.



Toshiba Regza 32WL68A

.: CONTACT Toshiba
.: ONLINE www.toshiba.com.au
.: PRICE $1,999 (without tuner)

Toshiba's just-released Regza range raises the bar for LCD-based TVs. It comes in two versions: with an HDTV tuner and without. We've tested the 1080i/720p 32WL68A 32in model, which uses a 100Hz engine to address the traditional problem of motion blur experienced by LCDs.

NOTEBOOKS – PERSONAL

Toshiba A200

.: CONTACT Toshiba
.: ONLINE www.toshiba.com.au
.: PRICE $2,299 (as reviewed)

The Toshiba outshone its rivals in our Labs tests with great Core 2 Duo performance and solid battery life. Unlike some heavier rivals, this 15.4in unit is a portable 2.7kg, and for the price it's stacked with features, including a 160GB hard drive, 802.11n networking, fingerprint reader and webcam. It also handles Vista with ease.

Acer Aspire 4920G

.: CONTACT Acer
.: ONLINE www.acer.com.au
.: PRICE $1,799

This is a mid-size portable with a 14.1in screen and 2.68kg starting weight, and we're impressed with the bang for buck. Under the hood our test unit had a solid configuration – Intel Core 2 Duo T5450 1.66GHz, 2GB RAM, 160GB HDD, Vista Home Premium and ATI Mobility Radeon X2500. The key is strong 3D grunt as well as general nippiness.

ADSL2+ MODEM/ROUTERS

Dynalink RTA1025W

.: CONTACT Dynalink
.: ONLINE www.dynalink.com.au
.: PRICE $179

This modem is a bargain at $179. It performed well in our ADSL2+ and wireless tests and was also a strong performer in Annex M tests. The only area for improvement is long-range wireless, where the 1025W only managed 800Kbit/s, but this won't be a significant concern for most people.

Dynalink RTA1046VW

.: CONTACT Dynalink
.: ONLINE www.dynalink.com.au
.: PRICE $279

Performance is nearly as good as the 1025W, but for your extra $100 you get two inbuilt VoIP ports for you to connect standard phones to (and make two calls at the same time). And if you want the fastest possible modem at 1km, this is it: 19.85Mbit/s.

MULTIFUNCTION – HOME

HP PhotoSmart C6180

.: CONTACT HP
.: ONLINE www.hp.com.au
.: PRICE $449

At its heart, the C6180 has HP's latest-generation six-ink printer that relies on separate cartridges for each colour. The black ink is pigment-based, so you can be sure of crisp, black text, while running costs for mono printing are reasonably low at around 4c per A4 text page.

Lexmark X4550

.: CONTACT Lexmark
.: ONLINE www.lexmark.com.au
.: PRICE $199

An inkjet all-in-one, this unit has good print, scan and copy quality, especially given the relatively low price. At 46cm wide, it's quite compact for an all-in-one, with wireless and USB connectivity. Media cards (SD, MMC, xD, Memory Stick and CF) and USB storage devices are supported, and nominal print speed is 18ppm for colour documents.

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Money FINALIST 2005
Money WINNER 2006
Money FINALIST 2007
Money WINNER 2007

Telstra switches on 30Mbit/s cable

Telstra implements 30Mbit/s cable broadband, but only for customers in Sydney and Melbourne. *Dan Warne* reports.

The service is only available to the 1.8 million households passed by Foxtel cable in Sydney or Melbourne. The other million or so people in Brisbane, the Gold Coast, Adelaide and Perth who could get it will be limited to 17Mbit/s speed. Telstra spokesman Craig Middleton said the faster cable speeds were achieved without any change in the underlying cable technology — the telco had simply moved the cable headend units out to telephone exchanges to bring them closer to customers' homes. Telstra said that people with a 'compatible modem' and who were already signed up to a 'Cable Extreme' plan would only need to turn off their modem and switch it back on again to get the 30Mbit/s speed upgrade. In addition to the new download speeds, Telstra has increased the upload speed to 1Mbit/s, which finally makes cable comparable to ADSL2+. However, Telstra admitted that wireless networking would be a bottleneck in getting maximum speed from its new 30Mbit/s plans. It was forced to put a disclaimer on its system requirements page, reading: "If you use a Wi-Fi modem, then the actual download speed will be slower than our top speeds." Telstra currently only offers 802.11g-compatible modems which generally provide a maximum Wi-Fi throughput speed of around 20Mbit/s in real life. The company does not yet offer an 802.11n model, which would provide 30Mbit/s or higher speeds. The 30Mbit/s plans range from $39.95 for 200MB of usage to $69.95 for the 12GB plan (with usage shaped after 12GB to dialup speed), through to $129.95 for 60GB.

Around 35% of the population will be unable to access the new speeds when the 30Mbit/s speed is activated.

your monthly broadband guide

APC is proud to partner with the independent broadband price-monitoring service Broadband Choice (***broadbandchoice.com.au***) to bring you the best ADSL and cable deals.

The comparison table on the following pages focuses on internet service providers that best serve the majority of *APC* readers' needs — those that have national coverage (though we have included some ISPs that provide higher than 2Mbit/s speed services in limited areas).

Only those meeting at least three of our four plan selection criteria are listed:

Budget plan: cheapest deal under $35/month.

Light plan: cheapest deal under $60/month, with at least 1.5Mbit/s speed and 5GB data.

Family plan: largest download allowance under $70/month, at least 1.5Mbit/s and 10GB data.

High-speed: cheapest 1.5Mbit/s plan under $100/month, with 30GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as its limit.

APC has picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest-priced option was selected.

The installation price doesn't include a modem because you may find you'll get better value by buying one separately.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet the selection criteria. There may be ISPs we didn't list that will provide better deals (but which only service your local area or state).

ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details on how to become part of the database.

Data for our table was extracted from the Broadband Choice database on 26 September 2007.

in brief

MOBILE NETWORKS PROMISE 100MBIT/s

Samsung has demoed a mobile network data service that can offer 100Mbit/s per user. It's nominally named '4G', and Samsung showed journalists a bus travelling at 60km per hour successfully handing over from cell to cell.

TELSTRA'S NEXT G COVERAGE CANED

The ACCC is prosecuting Telstra for false advertising, alleging that it has engaged in misleading or deceptive conduct by representing that the Next G mobile network "covers the entire country". The government has been forced to vary the conditions of Telstra's carrier licence to stop the telco shutting down its CDMA network prematurely. Telstra has previously given an assurance that Next G coverage would be equivalent, but has been fighting tooth and nail to avoid being held to the promise.

FUJITSU OFFERS UNLOCKED LAPTOP

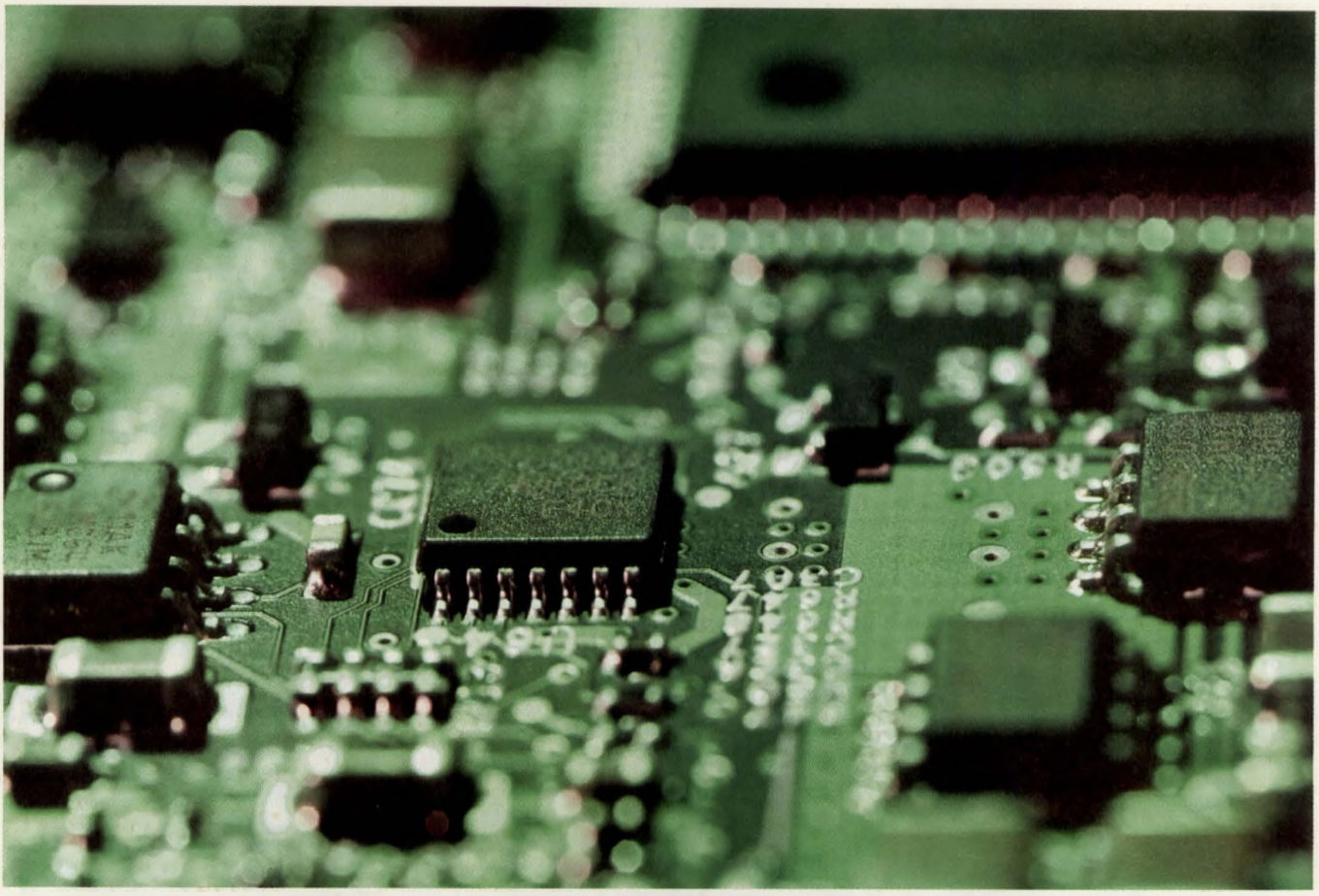
Do you like the idea of a laptop with an inbuilt HSDPA modem for ultimate mobility, but hate the idea of being locked to the carrier that has struck a deal with the laptop maker? Fujitsu has unveiled its new Lifebook Q2010, and it comes with HSDPA capabilities that can be used with any mobile network. Ten points to Fujitsu for putting the paying customer first. A detailed writeup is at *http://apcmag.com/node/7102*.

Name	Phone	Online	Budget plan (under $35)	Light plan (under $60, at least 1.5Mbit/s, min 5GB data limit)	Family plan (under $70, at least 1.5Mbit/s, min 10GB data limit)	High-speed plan (under $100, at least 1.5Mb/s, min 30GB data limit)	National	Spam filtering	Setup fee and contract length	Rapid transfer
Super-fast broadband ISPs (faster than 1.5Mb/s)										
aaNet ADSL2+	1300 665 076	www.aanet.com.au	$19.90†* 1GB+ 24Mbit/s	$39.90†* 8GB+ 24Mbit/s	$49.90†* 16GB+ 24Mbit/s	$79.90†* 32GB+ 24Mbit/s	✘	✘	$119 12mths	✔
AAPT LiveNet ADSL2+	138 888	http://home.aapt.com.au	$29.95† 1GB^ 24Mbit/s	$39.95† 5GB^ 24Mbit/s	$59.95† 20GB^ 24Mbit/s	N/A	✘	✔	$100 1mth	✘
Blackstump ADSL2	1800 890 600	www.blackstump.net.au	N/A	$44.95† 20GB+ 2Mbit/s	$59.95† 30GB+ 4Mbit/s	$59.95† 30GB+ 4Mbit/s	✔	✔	$129.95 12mths	✔
Comcen ADSL2+	1300 300 324	www.comcen.com.au	$29.95†* 1GB+ 24Mbit/s	$39.95† 5GB+ 24Mbit/s	$69.95† 40GB 24Mbit/s	$69.95† 40GB 24Mbit/s	✘	✔	$50 12mths	✘
Comstech Systems ADSL2+	1300 550 664	www.comstech.com.au	N/A	$51.50† 5GB 24Mbit/s	$66.95† 25GB 24Mbit/s	$77.50† 50GB 24Mbit/s	✔	✔	$133.95 6mths	✔
Dodo Super Fast ADSL2+	132 473	www.dodo.com.au	$9.99†* 1GB+^ 24Mbit/s	$29.99†* 5GB+^ 24Mbit/s	$49.99†* 15GB+^ 24Mbit/s	N/A	✘	$1.90	$129.99 1mth	✘
Dodo High Speed ADSL2+	132 473	www.dodo.com.au	$29.99†* 1GB+^ 24Mbit/s	$39.99†* 5GB+^ 24Mbit/s	$59.99†* 15GB+^ 24Mbit/s	N/A	✘	$1.90	$129.99 1mth	✘
Empcom ADSL2+	1300 731 368	www.empcom.net	N/A	$59.95 20GB 24Mbit/s	$59.95 20GB 24Mbit/s	$89.95 40GB 24Mbit/s	✘	✘	$129 6mths	✘
EscapeNet ADSL Home	1300 135 235	www.esc.net.au	$29.90† 500MB 24Mbit/s	$39.90† 5GB 24Mbit/s	$59.90† 25GB 24Mbit/s	$89.90† 50GB 24Mbit/s	✔	✔	$99 6mths	✔
Green Tree Frog ADSL 2+ ULL	1300 854 820	www.greentreefrog.net.au	$29.95† 2GB 24Mbit/s	$39.60† 5GB 24Mbit/s	$66† 20GB 24Mbit/s	$99† 40GB 24Mbit/s	✘	✔	$0 12mths	✘
iiNet broadband2+ ADSL (24Mbit)	131 917	www.iinet.net.au	$29.95† 500MB+ 24Mbit/s	$49.95† 7GB+ 24Mbit/s	$69.95† 20GB+ 24Mbit/s	$99.95† 40GB+ 24Mbit/s	✘	✔	$79.95 6mths	✘
ISP ADSL2+	1300 304 288	http://w3.isp.net.au	N/A	$36.30†* 16GB 24Mbit/s	$69.30†* 42GB 24Mbit/s	$69.30†* 42GB 24Mbit/s	✘	✔	$145.65 6mths	✘
Internode Extreme ADSL2+	136 633	www.internode.on.net	N/A	$59.95 20GB 24Mbit/s	$59.95 20GB 24Mbit/s	$74.95 30GB 24Mbit/s	✘	✔	$129 6mths	✘
Koala Residential ADSL2+	1300 720 109	www.koalatelecom.com.au	N/A	$44.95† 5GB+ 24Mbit/s	$69.95† 20GB+ 24Mbit/s	$89.95† 30GB+ 24Mbit/s	✔	✔	$149.95 6mths	✘
Koala Usenet Dedicated	1300 720 109	www.koalatelecom.com.au	N/A	$49.95† 30GB 24Mbit/s	$59.95† 50GB 24Mbit/s	$49.95† 30GB 24Mbit/s	✔	✔	$149.95 6mths	✔
Letsgo Go ADSL2+ 24Mbit	1300 556 114	www.letsgo.com.au	N/A	$39.95† 15GB 24Mbit/s	$59.95† 60GB 24Mbit/s	$59.95† 60GB 24Mbit/s	✘	✔	$99 12mths	✘
Netspace Home ADSL2+	131 456	www.netspace.net.au	N/A	$39† 5GB+ 24Mbit/s	$69† 20GB+ 24Mbit/s	$89† 30GB+ 24Mbit/s	✘	✔	$99 6mths	✘
Netspace SOHO ADSL2+	131 456	www.netspace.net.au	N/A	$49.95† 5GB 24Mbit/s	$59.95† 10GB 24Mbit/s	$99.95† 30GB 24Mbit/s	✘	✔	$99 6mths	✘
OptusNet Cable	1800 504 504	http://personal.optus.com.au	N/A	$59.99† 15GB^ 10Mbit/s	$59.99† 15GB^ 10Mbit/s	$99.99† 30GB^ 10Mbit/s	✘	✔	$89 12mths	✘
OptusNet DSL Direct	1800 504 504	http://personal.optus.com.au	N/A	$59.99† 15GB^ 24Mbit/s	$59.99† 15GB^ 24Mbit/s	$99.99† 30GB^ 24Mbit/s	✘	✔	$89 12mths	✘
PrimusNET up to 8000Kbps	1300 850 000	www.primus.com.au	$29.95† 1GB 8Mbit/s	$49.95† 5GB 8Mbit/s	$69.95† 20GB 8Mbit/s	$89.95† 40GB 8Mbit/s	✘	$4	$118 1mth	✘
PrimusNET ADSL2+	1300 850 000	www.primus.com.au	$29.95† 1GB+ 24Mbit/s	$49.95† 7GB+ 24Mbit/s	$69.95† 12GB+ 24Mbit/s	N/A	✘	$4	$0 12mths	✘
Soul ADSL2+	133 444	www.mysoul.com.au	$34.95† 2GB+ 24Mbit/s	$44.95† 5GB+ 24Mbit/s	$69.95† 30GB+ 24Mbit/s	$69.95† 30GB+ 24Mbit/s	✘	✔	$119 12mths	✘
Spin ADSL2+	1300 303 375	www.spin.net.au	$29.95†* 1GB+ 24Mbit/s	$39.95† 5GB+ 24Mbit/s	$69.95† 40GB 24Mbit/s	$69.95† 40GB 24Mbit/s	✘	✔	$50 12mths	✘
TPG Residential ADSL2+	1300 360 855	www.tpg.com.au	$29.99* 600MB 24Mbit/s	$49.99 18GB+ 24Mbit/s	$69.99 40GB+ 24Mbit/s	$59.99 30GB+ 24Mbit/s	✘	✔	$59.95 12mths	✘
Westnet Broadband2+	131 960	www.westnet.com.au	$29.95†* 500MB 24Mbit/s	$49.95† 5GB+ 24Mbit/s	$69.95† 10GB+ 24Mbit/s	N/A	✘	$0.83	$139 12mths	✘
Regular broadband ISPs (1.5Mb/s or less)										
.Netcall ADSL (Bundled)	1300 665 076	www.netcall.com.au	$24.90†* 2GB+ 256Kbit/s	$44.90†* 16GB+ 1.5Mbit/s	$54.90†* 24GB+ 1.5Mbit/s	$84.90†* 32GB+ 8Mbit/s	✔	✔	$145 12mths	✔
.Netcall ADSL (Unbundled)	1300 665 076	www.netcall.com.au	$29.90* 2GB+ 256Kbit/s	$49.90* 16GB+ 1.5Mbit/s	$59.90* 24GB+ 1.5Mbit/s	$89.90* 32GB+ 8Mbit/s	✔	✔	$145 12mths	✔
aaNet ADSL (Bundled)	1300 665 076	www.aanet.com.au	$24.90†* 2GB+ 256Kbit/s	$44.90†* 16GB+ 1.5Mbit/s	$54.90†* 24GB+ 1.5Mbit/s	$84.90†* 32GB+ 8Mbit/s	✔	✘	$145 12mths	✔
aaNet ADSL (Unbundled)	1300 665 076	www.aanet.com.au	$29.90* 2GB+ 256Kbit/s	$49.90* 16GB+ 1.5Mbit/s	$59.90* 24GB+ 1.5Mbit/s	$89.90* 32GB+ 8Mbit/s	✔	✘	$145 12mths	✔
AAPT Broadband	138 888	http://home.aapt.com.au	$34.95† 1GB^ 256Kbit/s	$59.95† 15GB^ 1.5Mbit/s	$59.95† 15GB^ 1.5Mbit/s	N/A	✔	✔	$100 1mth	✔
AuNix Broadband	1300 765 742	www.aunix.com.au	$29.95† 15GB 256Kbit/s	$59.95† 20GB+ 1.5Mbit/s	$59.95† 20GB+ 1.5Mbit/s	$74.95† 35GB 1.5Mbit/s	✔	✔	$89 6mths	✔
Australia On Line ADSL	1300 650 661	www.australiaonline.net.au	$29.95 1GB+ 256Kbit/s	$49.95 5GB 1.5Mbit/s	$64.95 10GB 1.5Mbit/s	N/A	✔	✔	$99 6mths	✔
Australis Internet ADSL	1800 288 871	www.australis.net	$34.95 1GB 256Kbit/s	$59.95 30GB+ 1.5Mbit/s	$59.95 30GB+ 1.5Mbit/s	$59.95 30GB+ 1.5Mbit/s	✔	✔	$139 1mth	✔
BIT.net	1300 248 638	www.bit.net.au	$19.95† 2GB 256Kbit/s	$59.95† 10GB 1.5Mbit/s	$69.95† 20GB 1.5Mbit/s	$89.95† 40GB 1.5Mbit/s	✔	✔	$132 6mths	✔

Regular broadband ISPs (1.5Mbit/s or less)

Name	Phone	Online	Budget plan (under $35)	Light plan (under $60, at least 1.5Mbit/s, min 5GB data limit)	Family plan (under $70, at least 1.5Mbit/s, min 10GB data limit)	High-speed plan (under $100, at least 1.5Mb/s, min 30GB data limit)	National	Spam filtering	Setup fee and contract length	Rapid transfer
Blackstump ADSL	1800 890 600	www.blackstump.net.au	$34.95 5GB 256Kbit/s	$57.95 5GB 1.5Mbit/s	$69.95 15GB 1.5Mbit/s	$79.95 No limit 1.5Mbit/s	✔	✔	$108 6mths	✔
Blackstump ADSL Bundles	1800 890 600	www.blackstump.net.au	$34.95†* 500MB 512Kbit/s	$47.95† 5GB 1.5Mbit/s	$69.95† 15GB 1.5Mbit/s	$79.95† No limit 1.5Mbit/s	✔	✔	$108 6mths	✔
BBI Flat Rate DSL	1300 785 956	www.brownbear.net.au	$32.95 2GB 256Kbit/s	$56.95 5GB 1.5Mbit/s	$69.95 25GB 1.5Mbit/s	$79.95 35GB 1.5Mbit/s	✔	✔	$119 6mths	✔
BBI Excess DSL	1300 785 956	www.brownbear.net.au	$32.95* 2GB 256Kbit/s	$56.95* 5GB 1.5Mbit/s	$69.95* 25GB 1.5Mbit/s	$79.95* 35GB 1.5Mbit/s	✔	✔	$119 6mths	✔
Brown Bear DSL/Phone	1300 785 956	www.brownbear.net.au	$19.95†* 1GB 256Kbit/s	$54.95† 5GB 1.5Mbit/s	$64.95† 25GB 1.5Mbit/s	$74.95† 35GB 1.5Mbit/s	✔	✔	$119 6mths	✔
Chariot ADSL	1300 137 425	www.chariot.net.au	$29.95* 500MB 256Kbit/s	$54.95 5GB 1.5Mbit/s	$69.95 25GB 1.5Mbit/s	$79.95 40GB 1.5Mbit/s	✔	✔	$110 6mths	✔
Comcen Internet ADSL	1300 300 324	www.comcen.com.au	$29.95† 10GB 256Kbit/s	$44.95†* 5GB+ 1.5Mbit/s	$69.95† 20GB+ 1.5Mbit/s	$99.95† 30GB+ 1.5Mbit/s	✔	✔	$99 6mths	✔
Concept Networks ADSL	1300 132 331	www.conceptual.net.au	$29.95* 500MB 256Kbit/s	$59.95* 5GB 1.5Mbit/s	$69.95* 15GB 1.5Mbit/s	$89.95 30GB 1.5Mbit/s	✔	✔	$99 6mths	✔
dataoz Residential ADSL	1300 765 928	www.dataozsolutions.com.au	$29.95 500MB 256Kbit/s	$56.50* 10GB 1.5Mbit/s	$56.50* 10GB 1.5Mbit/s	$98.50* 50GB 1.5Mbit/s	✔	✔	$129.50 6mths	✔
Dinkum Internet ADSL	1300 346 586	www.dinkum.net.au	$34.95 1GB 256Kbit/s	$59.95 5GB 1.5Mbit/s	$69.95 15GB 1.5Mbit/s	$89.95 50GB 1.5Mbit/s	✔	✔	$129 6mths	✔
Dodo ADSL	132 473	www.dodo.com.au	$19.99†* 500MB+^ 256Kbit/s	$39.99†* 5GB+^ 1.5Mbit/s	$59.99†* 15GB+^ 1.5Mbit/s	N/A	✔	$1.90	$129.99 1mth	✔
EFTel ADSL	1300 550 550	http://w3.eftel.com	$19.95†* 500MB 256Kbit/s	$59.95†* 7GB 1.5Mbit/s	$69.95†* 25GB+ 1.5Mbit/s	N/A	✔	✔	$125 12mths	✔
EscapeNet ADSL Home	1300 135 235	www.esc.net.au	$29.90 500MB 256Kbit/s	$39.90† 5GB 24Mbit/s	$59.90† 25GB 24Mbit/s	$89.90† 50GB 24Mbit/s	✔	✔	$99 6mths	✔
eTelecom ADSL	1300 303 217	www.etelecom.com.au	$29.95†* 1GB 256Kbit/s	$59.95†* 5GB 1.5Mbit/s	$69.95†* 15GB 1.5Mbit/s	N/A	✔	✔	$99 12mths	✔
ISP ADSL	1300 304 288	http://w3.isp.net.au	$33* 3GB 256Kbit/s	N/A	$69.30* 25GB 1.5Mbit/s	$88* 30GB 8Mbit/s	✔	✔	$132 6mths	✔
Internode Home ADSL	136 633	www.internode.on.net	N/A	$49.95 5GB 1.5Mbit/s	$69.95 20GB 1.5Mbit/s	$84.95 30GB 1.5Mbit/s	✔	✔	$129 6mths	✔
iSage Internet ADSL	1300 725 789	www.isage.aunz.net	$34.95 15GB+ 256Kbit/s	$59.95† 20GB+ 1.5Mbit/s	$59.95† 20GB+ 1.5Mbit/s	$79.95 35GB+ 1.5Mbit/s	✔	✔	$99 6mths	✔
iTEL ADSL	133 636	www.itel.net	$34.95†* 4GB 256Kbit/s	$59.95†* 5GB 1.5Mbit/s	N/A	$79.95† 60GB 1.5Mbit/s	✔	✔	$129 12mths	✔
Koala Residential ADSL1	1300 720 109	www.koalatelecom.com.au	$34.95† 2.5GB+ 256Kbit/s	$49.95† 5GB+ 1.5Mbit/s	$69.95† 15GB+ 1.5Mbit/s	$89.95† 30GB+ 1.5Mbit/s	✔	✔	$149.95 6mths	✔
Koala Business ADSL1	1300 720 109	www.koalatelecom.com.au	$34.95†* 2GB+ 512Kbit/s	$49.95†* 7GB+ 1.5Mbit/s	$59.95†* 15GB+ 1.5Mbit/s	$79.95†* 30GB+ 1.5Mbit/s	✔	✔	$149.95 6mths	✔
Lizzy ADSL	1300 364 074	www.lizzy.com.au	$29.95 1GB+ 256Kbit/s	$49.95 5GB 1.5Mbit/s	$64.95 10GB 1.5Mbit/s	N/A	✔	✔	$99 6mths	✔
Netspace Home ADSL	131 456	www.netspace.net.au	$29.95† 10GB+ 256Kbit/s	$39.95† 5GB+ 1.5Mbit/s	$69.95† 20GB+ 1.5Mbit/s	$99.95† 30GB+ 1.5Mbit/s	✔	✔	$99 6mths	✔
NetSpeed ADSL	131 676	www.netspeed.com.au	$29.95†* 1GB+ 256Kbit/s	$54.95†* 5GB+ 1.5Mbit/s	$64†* 10GB+ 1.5Mbit/s	N/A	✔	✔	$139 12mths	✔
Pacific Internet DSL	133 635	www.pacific.net.au	$29.95† 3GB 256Kbit/s	$49.95 5GB 1.5Mbit/s	$49.95† 10GB 1.5Mbit/s	N/A	✔	✔	$99 6mths	✔
Primus Flexible Broadband	1300 850 000	www.primus.com.au	$24.95† 500MB 256Kbit/s	$54.95† 5GB 1.5Mbit/s	$69.95† 20GB 1.5Mbit/s	N/A	✔	✔	$118 1mth	✔
Rabbit Internet ADSL	1800 501 106	http://rabbit.com.au	$28.95†* 500MB 256Kbit/s	$58†* 5GB 1.5Mbit/s	$70†* 30GB 1.5Mbit/s	$70†* 30GB 1.5Mbit/s	✔	✔	$104.50 6mths	✔
Soul ADSL	133 444	www.mysoul.com.au	$29.95 No limit 256Kbit/s	$59.95† 10GB+ 1.5Mbit/s	$59.95† 10GB+ 1.5Mbit/s	N/A	✔	✔	$119 12mths	✔
Spin Internet	1300 303 375	www.spin.net.au	$29.95† 10GB 256Kbit/s	$44.95†* 5GB+ 1.5Mbit/s	$69.95† 20GB+ 1.5Mbit/s	$99.95† 30GB+ 1.5Mbit/s	✔	✔	$99 6mths	✔
SuperNerd SuperDSL	1300 888 090	www.supernerd.com.au	$26.95 1GB 256Kbit/s	$59.95 15GB 1.5Mbit/s	$59.95 15GB 1.5Mbit/s	$72.95 30GB 1.5Mbit/s	✔	✔	$115 6mths	✔
TalkTODAY ADSL	1800 486 329	www.talktoday.com.au	$29.95† 500MB^ 256Kbit/s	$54.95† 5GB^ 1.5Mbit/s	$69.95† 30GB^ 1.5Mbit/s	$69.95† 30GB^ 1.5Mbit/s	✔	✔	$119 6mths	✔
TSN Broadband	131 486	www.tsninternet.com.au	N/A	$49.95 5GB 1.5Mbit/s	$69.95 20GB 1.5Mbit/s	$99.95 40GB 1.5Mbit/s	✔	✔	$129 6mths	✔
Water Sprite ADSL1 Shaped plans	1300 720 656	www.watersprite.net.au	$35 2GB 256Kbit/s	$60 5GB 1.5Mbit/s	$70 15GB 1.5Mbit/s	$84 35GB 1.5Mbit/s	✔	✔	$150 6mths	✔
Water Sprite ADSL1 Excess charged plans	1300 720 656	www.watersprite.net.au	$35* 2GB 256Kbit/s	$60* 5GB 1.5Mbit/s	$70* 15GB 1.5Mbit/s	$84* 35GB 1.5Mbit/s	✔	✔	$150 6mths	✔
Westnet Broadband1	131 960	www.westnet.com.au	$29.95† 500MB 256Kbit/s	$59.95† 10GB+ 1.5Mbit/s	$69.95† 20GB+ 1.5Mbit/s	$99.95† 40GB+ 1.5Mbit/s	✔	$0.83	$99 6mths	✔
Winshop ADSL	1300 137 772	www.winshop.com.au	$29.95 500MB 256Kbit/s	$49.95 8GB 1.5Mbit/s	$59.95 15GB 1.5Mbit/s	N/A	✔	✔	$139 12mths	✔

*Key: * ISP charges excess usage fees when you exceed your download limit; † This price only available if bundled with long distance telephony from the ISP; + Additional download allowance available with this plan for use in off-peak periods; ^ ISP combines sent and received data when calculating usage. # Minimum BigPond Cable setup fee is based on 12-month contract with modem included. Telstra does not offer a BYO modem option.*



Radical hardware upgrades

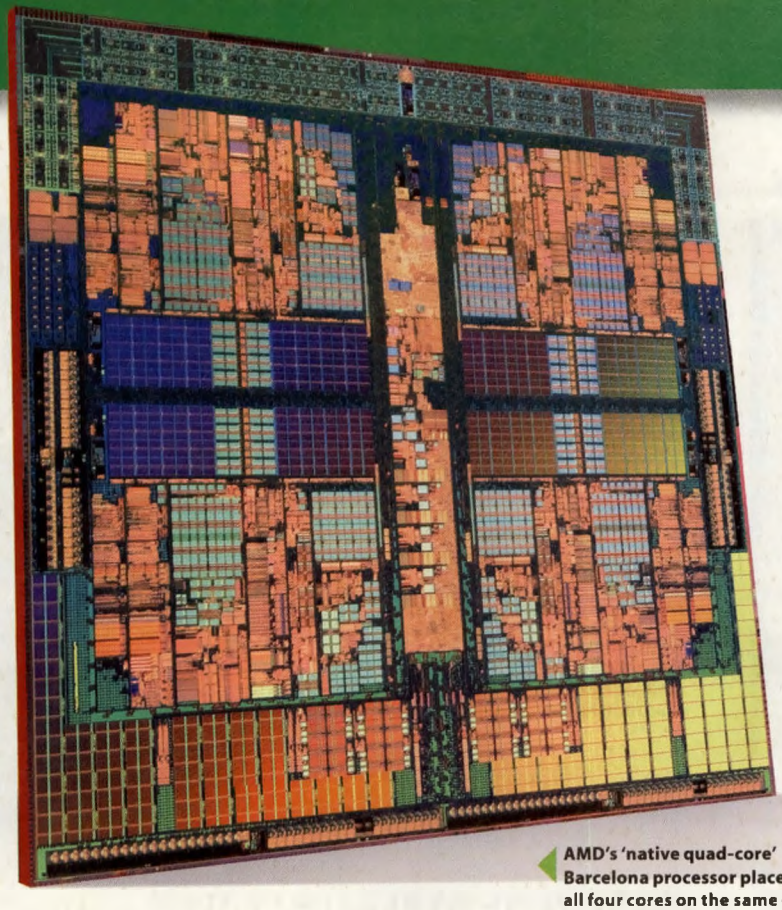
Technological change is getting faster, and almost all aspects of the PC are being updated over the next few months. *James Morris* tells us what to look out for.

Don't take your eye off the PC market, as it's in a state of change, and we'll be revealing what these new technologies can do for you.

Will that top-of-the-range processor you just bought remain the ultimate in PC power? Or will your new motherboard support the next generation of components? We will be explaining all the latest CPUs, sockets, buses, graphics enhancements and software updates which are just around the corner.

When Intel launched its first quad-core processors, they arrived unopposed. Although AMD did counter with its Quad FX '4x4' high-end gaming system, this was based on a dual-processor platform using dual-core processors, and it hasn't exactly been flying off the shelves. At the same time, AMD criticised Intel for taking the same strategy with its quad-core parts as it had with its Pentium D dual-core ones. Instead of designing a brand-new dual-core processor to create the quad-core Core 2s and Xeons, Intel bolted two dual-core processors together, running on a shared FSB.

AMD has criticised this design, as it packages two dies together. Although the two cores on each die can communicate at clock speed, cores on separate dies can only exchange data through the frontside bus (FSB), which is an order of magnitude slower. In contrast, AMD argues that its design is 'native quad-core', because all four cores are on the same die and can exchange data without leaving the die. Well, at long last, AMD's



AMD's 'native quad-core' Barcelona processor places all four cores on the same die.

WILL THAT TOP-OF-THE-RANGE PROCESSOR YOU JUST BOUGHT REMAIN THE ULTIMATE IN PC POWER?

native quad-core processors are about to arrive — at least for workstation and server users.

AMD's first native quad-core Opterons, codenamed Barcelona, adopt a three-tier approach to cache, which AMD also used with its K6-III. However, when working in a quad-core environment, each core has its own portions of Level 1 and Level 2, but all four cores share a single 2MB allocation of Level 3 cache. They then share access to the DDR2 memory controller and trio of HyperTransport links via the System Request Queue and Crossbar Switch. AMD's exclusive cache structure also means that data at one cache level won't be stored anywhere else, as cores can request data from each other using the Modified Owned Exclusive Shared Invalid (MOESI) system. So, Barcelona's Level 1, 2 and 3 can be aggregated together, albeit with variable access speeds.

COOLER AND QUIETER

Barcelona is also host to an array of new power-management technologies. Cores can be independently powered up and down, and Dual Dynamic Power Management means the memory controller and cores can be switched independently. This is handy where integrated graphics use the memory controller, but the cores are otherwise relatively idle. However, despite its on-paper technological advantages over Intel's quad-core Xeons, Barcelona has faced its critics. Besides arriving almost a year later than Intel's quad-core processors, AMD's top native quad-core Opteron 2350 will only run at up to 2GHz at launch, although an SE version clocked at 2.3GHz is imminent. With Intel's Xeon X5365 already running at 3GHz, Barcelona has plenty of catching up to do.

The mainstream desktop version of AMD's native quad-core processor will take even longer to arrive: it's due at the end of 2007. But, although it will be technologically similar to Barcelona, AMD is marking its arrival with a lot more pomp and circumstance. The brand name is changing from Athlon to Phenom, and a new numbering scheme will be launched for mainstream parts. FX will remain the enthusiast derivative, so the Phenom FX-80 will run at up to 2.4GHz and its HyperTransport 3 will operate at 3.2GHz or more. The Phenom FX-90 series aimed at the Quad FX platform isn't due until 2008, with the fastest FX-91 expected to be a 2.6GHz part.

The Phenom X4 will be AMD's mainstream quad-core part, with the X2 being a dual-core derivative. The first to arrive will be the Phenom X4 GP-7000 and 7100. The latter will run at up to 2.4GHz with a 3.6GHz HyperTransport

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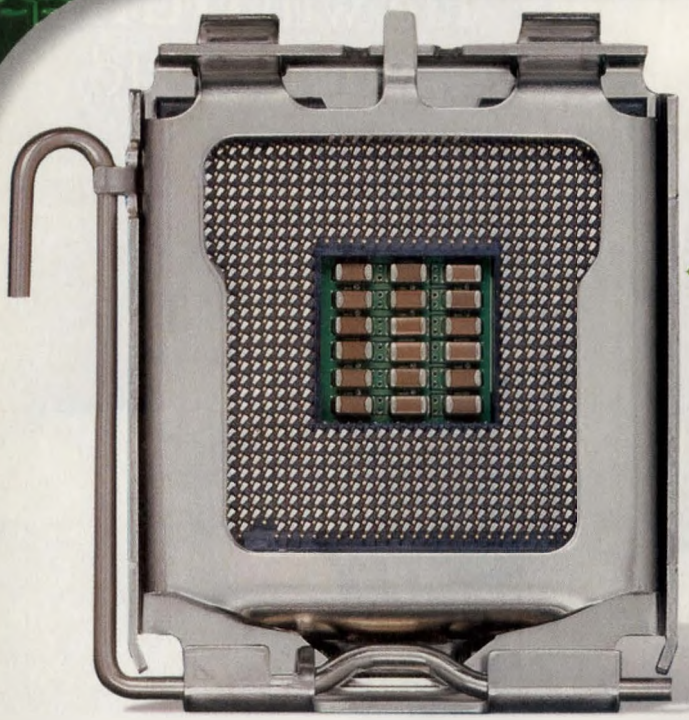
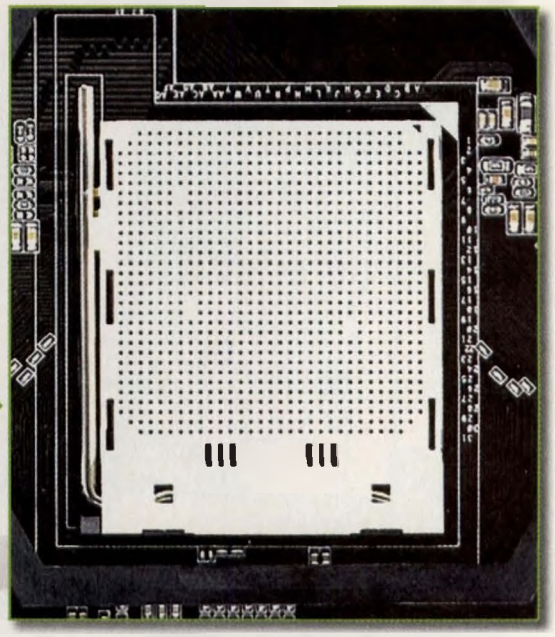


Intel's Socket LGA 775 looks set to be supported well into 2008.



Socket AM2+ will be backwards-compatible with Socket AM2. Socket AM3 will use the same form factor.

3 bus, and the former at up to 2.2GHz with a 3.2GHz HyperTransport bus. Both processors will have a Thermal Design Power (TDP) of 89W — significantly less than current dual-core Athlon 64 FX processors. The first Phenom X2 will be the GP-6550, running at up to 2.4GHz with a 3.6GHz HyperTransport bus. As with the Opteron, however, Phenom has some catching up to do. A 3GHz version of the quad-core Phenom isn't due until mid-2008, although an X2 running at up to 2.8GHz is expected in the first quarter of 2008.

45NM PRODUCTION

At the same time as AMD's desktop processors are going native, Intel will be playing on its strengths and moving to a 45nm process. Around this time last year, the company was ramping up its 65nm production to surpass the incumbent 90nm. Another year, another die shrink: the number refers to feature dimension in one direction. So, by moving from 65nm to 45nm, the same processor takes up half the area, allowing faster clock speeds and lower power consumption.

Intel was already sampling 45nm parts at the end of 2006, in the shape of the Penryn, set to be the successor to the current Conroe-based mobile Core 2 Duos. Aside from the die shrink, Penryn will include a 6MB L2 cache and Enhanced Intel Dynamic Acceleration Technology. The latter allows the processor to channel power from one core to another, allowing it to speed up when one core is under-utilised. Deep Power Down Technology will significantly reduce the consumption of the processor during idle times. As with the 65nm die shrink, AMD trails Intel by some way in the shift to 45nm, with its first 45nm parts not due until late 2008. So the initial Phenoms will remain on the 65nm process.

> A VERSION OF HYPERTHREADING WILL RETURN, THIS TIME CALLED 'SIMULTANEOUS MULTITHREADING'

Wolfdale is the codename of the desktop version of Penryn, and Yorkfield the quad-core version, with the latter still essentially two dual-core chips packaged together. Wolfdale will have 410 million transistors, around 40 per cent more than Conroe. The new chip will only be about 50 per cent smaller than its predecessor, not half the size. The extra transistor budget goes to better virtualisation abilities, a fast block radix-16 divider, so it can execute four bits per clock cycle against Conroe's two, plus SSE4, which includes 50 new instructions. Wolfdale is expected to debut at 3.46GHz. Both Wolfdale and Yorkfield will use a 1,333MHz FSB, and Yorkfield has 12MB of L2 cache — three times that of the Phenom X4. The workstation and server iteration of Penryn will see its FSB rise to 1,600MHz in some models.

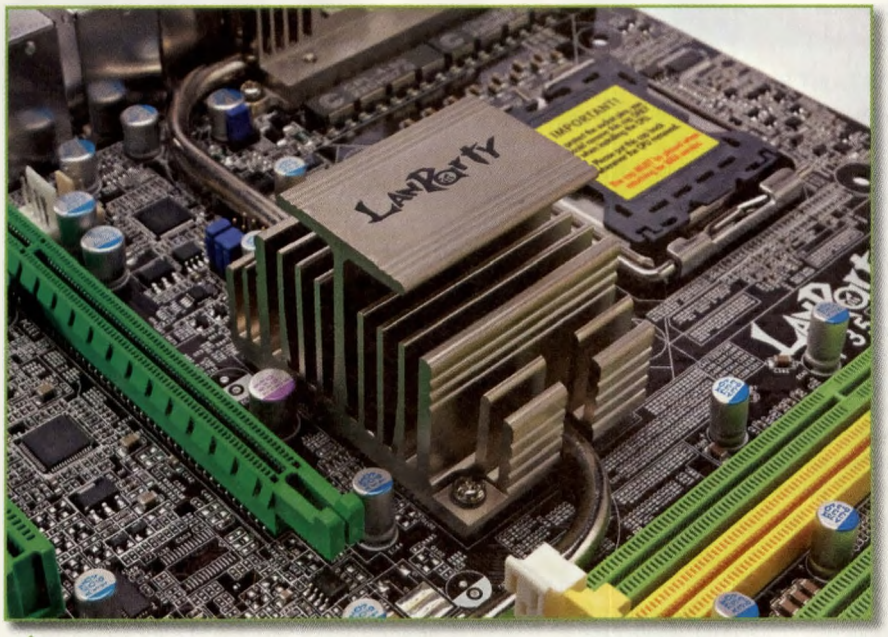
However, Penryn is very much an evolution of Conroe. Nehalem will be Intel's next big architectural development since the Core 2 processors arrived, and its first to deliver native quad-core and beyond. It will allegedly scale up to eight cores on a single die, and the first products will ship in 2008. A version of HyperThreading will return, this time called 'Simultaneous Multithreading', so an eight-core CPU will be able to handle 16 threads at the same time. Nehalem will also be available with an integrated memory controller and graphics, much like AMD's Fusion, due in 2009. It will also allegedly abandon the FSB in favour of a fast serial interconnect similar to HyperTransport — with the fabled Common System Interface (CSI) being a possible candidate.

SOCKET CHANGES

New processors almost always entail new chipsets, platforms and sockets. In the near future, Intel hopes to steal some of the fire away from AMD's Quad FX, before it gets its Phenom X4 upgrade. Skulltrail will partner a pair of quad-core processors, the QX6800 or later, into a dual-socket motherboard. The system will sport eight processing cores, but will be aimed at ultra, high-end enthusiasts rather than workstations. Sadly, it will have one feature in common with

FACT FILE!

Graphics cards are increasing in power exponentially, with Nvidia claiming its next generation will hit 1 teraflop. With all that processing ability available, graphics cards are being harnessed for tasks other than 3D rendering. GPGPU technologies from ATI and Nvidia will increasingly use graphics cards as co-processors for physics rendering, distributed tasks like Folding@Home and even scientific modelling in supercomputers.



Intel's P35 motherboards are with us now and ready for 45nm CPUs.

workstations — it will use FB-DIMM memory rather than standard DIMMs. This will add more cost to the system and is likely to ensure Skulltrail PCs consume even more watts than AMD's Quad FX.

Despite the new 45nm Intel processors on the horizon, the company is likely to continue using Socket LGA 775 (which arrived in mid-2004) well into 2008. However, Nehalem will apparently require Socket B and H (LGA 1366 and 715 respectively). Socket B has extra pins because it supports a processor with a built-in memory controller and integrated graphics.

AMD launched its first major socket revisions since the launch of Opteron and Athlon 64 just over a year ago — Socket F and Socket AM2. However, AMD shot itself in the foot by rapidly killing off its old Socket 754 and Socket 939 at the same time. This gave upgraders even greater incentive to drop AMD entirely and simply move over to Intel's Core 2 Duo. So, the next few AMD socket generations will not be such wild deviations. In fact, the upcoming two desktop CPU interconnects, Socket AM2+ and Socket AM3, will be physically identical to the current Socket AM2, except with some additional features available when used in tandem with the appropriate chipsets and processors. Socket AM2+ is due to arrive with the first Phenom processors later in 2007.

Socket AM3 was originally slated to be the next AMD socket. But with the slow pickup of DDR3, an interim solution was sought. So Socket AM2+ will arrive beforehand and bring with it HyperTransport 3 and split power planes, which will enable the Phenom's Dual Dynamic Power Management described above. But it will still only support DDR2 memory, for compatibility with existing processors. Essentially, Socket AM2 processors will still fit and work in Socket AM2+ motherboards, and Socket AM2+ processors will operate in Socket AM2 motherboards. So, neither current processors nor current motherboards will become obsolete until mid-2008. However, you will need to partner a Socket AM2+ motherboard with a Socket AM2+ processor to get the benefit from HyperTransport 3 and split power planes. With a Socket AM2 board, you will not get the benefit of HyperTransport 3 features and performance.

Socket AM3 won't arrive until the middle of 2008. This will bring with it support for DDR3, so you will need a DDR3-capable processor for a Socket AM3 motherboard. However, since Socket AM3 processors will allegedly support both DDR2 and DDR3, you should be able to fit one of them in your old Socket AM2 or AM2+ board. At the same time as Socket AM2+ revises AM2, Socket F+ will do something similar for Socket F, adding HyperTransport 3 support, but otherwise retaining the same 1207-pin form factor. This will form the basis of updated server and workstation platforms but also the next generation of Quad FX. It isn't due until the beginning of 2008.

CORE LOGIC ADVANCES

New processors usually come in tandem with new chipsets, and these in turn bring other novel new technologies, particularly in the bus department. Intel's P35 chipset (aka. Bearlake) arrived with support for DDR3 SDRAM memory, although the price and scarcity of the latter has meant only a few motherboards are available

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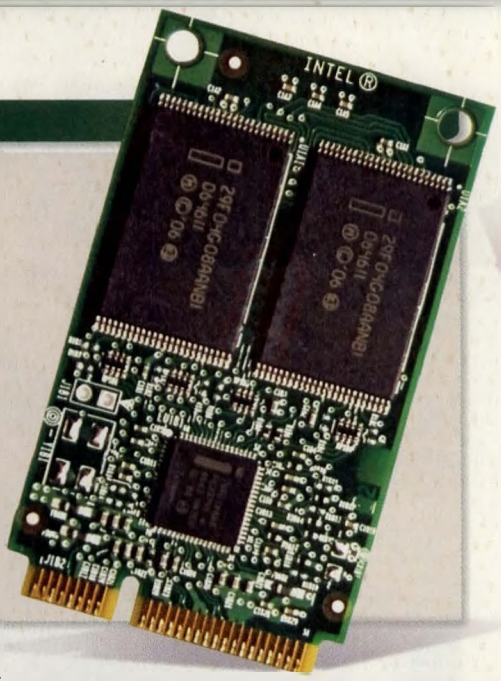
FLASH STORAGE TAKES OVER

FLASH MEMORY IS BECOMING AN IMPORTANT PART OF YOUR PC

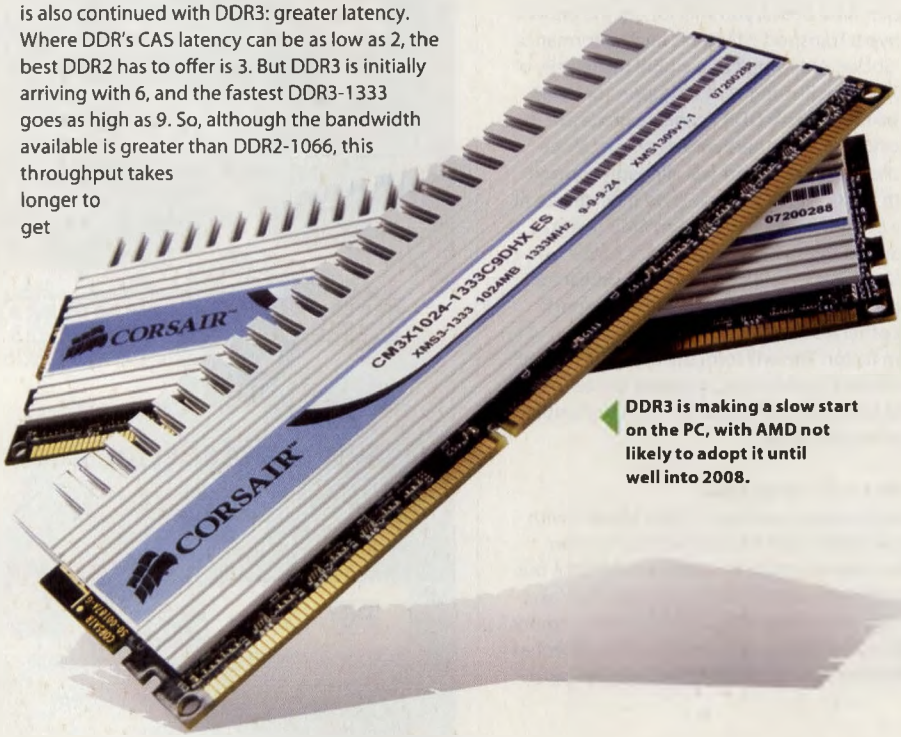
It has been an exciting few years for storage. The arrival of perpendicular recording last year gave the venerable hard disk a renewed future, with 1TB models now available. At the same time, flash memory has been finding a more significant role. Flash memory-based Solid State Disks (SSDs) are appearing in notebooks and UMPCs, although not yet in desktops. Now that Windows Vista is well and truly here, everyone can potentially take advantage of operating system support for the use of flash memory as a power-saving and performance-boosting enhancement. Intel's take on this has been its Robson technology, unveiled in its Centrino Pro mobile platform, aka. Santa Rosa. However, whilst the same technology was meant to be unveiled for desktop users around now, the launch has been delayed and it will now arrive towards the end of 2007 or even the beginning of 2008. This is allegedly due to the first version not performing as expected. Called Desktop Turbo Memory, it will either come in the form of an expansion card or the controller and NAND memory will be integrated on the motherboard. The power savings available are not so important for desktop users, considering that hard disks only draw a few watts, whereas high-end processors and graphics cards can consume hundreds of watts put together. But the fast access time of flash, compared to mechanical storage, and its rapidly decreasing price mean it is destined to find its way into a PC near you in the near future.



which take advantage of it so far. DDR3 is yet another step forward in clock-doubling memory technology. Where DDR is able to send data on both the rising and falling edges of the clock signal, DDR2 doubles the internal bus speed, so it can send four bits of data in the same number of clock cycles regular SDRAM takes to send one. DDR3 doubles the internal clock rate yet again, so it moves eight bits of data per clock cycle.

Because the memory modules themselves can now run half the speed of DDR2 to provide the same bandwidth, the voltage has dropped yet again, from 1.8V to 1.5V. This further lowers the power requirement, despite ramping up bandwidth. Unfortunately, another of the themes in the rise up of the DDR generations is also continued with DDR3: greater latency. Where DDR's CAS latency can be as low as 2, the best DDR2 has to offer is 3. But DDR3 is initially arriving with 6, and the fastest DDR3-1333 goes as high as 9. So, although the bandwidth available is greater than DDR2-1066, this throughput takes longer to get started. DDR3 uses the same 240-pin module, but with the notch in a different place to prevent you being able to install the wrong type.

Since AMD's processors have the memory controller built in, a new generation will be required to support DDR3. This is slated for late 2008, or even 2009. However, for Socket AM2+ new chipsets will be required which support HyperTransport 3. AMD's RD700 and Nvidia's MCP72 will be two of the first. HyperTransport 3 is a natural progression of the HyperTransport system and is essentially an increase in the bus clock speed. Where HyperTransport 1 runs at 800MHz and 2 at up to 1.4GHz, HyperTransport 3 has a theoretical maximum of 2.6GHz (5.2 gigatexels per second (GT/s) with clock-doubling similar to DDR memory, which equates to 20.8GB/s in each direction). So, it's potentially more than three times faster than the original iteration. However, just as most AMD chipsets using HyperTransport operate with a 1GHz iteration, HyperTransport 3 performance will be limited by processor and chipset support. The fastest Phenom processors currently on the roadmap use the 1.8GHz version of HyperTransport 3, running at 14.4GB/s in each direction.



DDR3 is making a slow start on the PC, with AMD not likely to adopt it until well into 2008.

PCI EXPRESS GRAPHICS BOOST

Another technology which requires appropriate chipset and motherboard support is the graphics bus. In January 2007, the specification for the second generation of PCI Express became available from the PCI-SIG standards body. PCI Express 2 doubles the bandwidth over the current 1.1 specification by increasing the frequency on each lane from 2.5GT/s to 5GT/s. So, a 16-lane PCI Express slot will have 8GB/s of bandwidth rather than 4GB/s in each direction, due to the 8B/10B coding that transfers 8-bits of

FACT FILE!

Desktop PCs are only just moving to DDR3, yet graphics cards with GDDR4 are already widely available, most notably ATI's Radeon X1950XTX and HD 2900XT. However, this is not because PC memory lags behind graphics cards – the two use different technologies. GDDR operates at a higher voltage than similarly numbered desktop DDR, so it can run at higher frequencies, and the clock-doubling technologies employed are usually different too.

Nvidia's GeForce 8000 series holds the performance crown, despite the arrival of ATI's Radeon HD 2900XT, so it will be Christmas before we see new GeForce cards.

data per ten electrical signals for greater reliability. It also enables hardware virtualisation, allowing multiple OSs to run simultaneously and share direct access to the hardware. PCI Express 2 is backwards-compatible with the first version, however.

Intel's X38 chipset (aka. Bearlake-X), the successor to its high-end 975X, is the first to support PCI Express 2, quickly followed by AMD's RD700 and Nvidia's MCP72 when AMD's Phenom is launched. Nvidia's C72 and C73, aimed at Intel processors, will also offer PCI Express 2, DDR3 memory support and compatibility with Intel's Penryn 45nm CPUs. Nvidia's MCP78 will also have Hybrid SLI. This allows integrated and discrete graphics to work dynamically together. When little 3D acceleration is required, the discrete graphics can be powered down and the integrated graphics used alone. But when extra 3D grunt is required, discrete and integrated graphics can work together using SLI to increase performance.

Now we turn to discrete graphics themselves. Since AMD has just released a new graphics chip in the shape of the Radeon HD 2000 series, it's likely to be Nvidia's turn next. The GeForce 8900 series was supposed to be the counter to the new Radeon, but since it hasn't lived up to performance expectations, Nvidia hasn't seen any need to up the ante just yet, even if the 2900XT is good value. However, it's allegedly readying the G92, which will power the GeForce 9000 series, for late 2007. Nvidia is claiming it will have three times the power of the GeForce 8800GTX.

In the interim, ATI's R650 is due in the next month or so. This will be a 65nm shrink of the 80nm R600, so it will offer lower power and potentially higher clocks. The Radeon HD 2900XT is one of the most watt-hungry cards currently on the market. Then, in the first half of 2008, ATI claims it will have its R700 ready. This will use a 55nm production process and will introduce a multicore approach to graphics. Entry-level cards will use a single core, two mainstream cards and high-end products four to eight cores. So with two cards in CrossFire, 16 GPU cores could be working in parallel. The R700 is likely to be called the Radeon 3000 series.

SERVICE PACK UPDATES

Graphics improvements will be a theme in future software releases, too. Operating systems are always the biggest news in the software market, and the launch of Windows Vista at the beginning of this year still has plenty of repercussions to be felt. Although it inaugurated DirectX 10, and now both ATI and Nvidia are shipping supporting hardware, Windows Vista's impact on gaming hasn't really been felt just yet. There are still precious few games available that take advantage of DirectX 10, and those which have encountered criticism. For example, the DirectX 10 version of Call of Duty has been condemned for its massive hit on performance, even with state-of-the-art hardware. However, titles specifically designed for DirectX 10 such as Crysis, Call of Juarez and Alan Wake are imminent, so there may at last be reasons to upgrade to Windows Vista for DirectX 10.

It's easy to forget that Windows Vista has actually been out for more than half a year. So it might come as a surprise that an early beta of the first service pack was recently released to a select cadre of testers. Service packs are usually considered to be bundles of hotfixes and security patches, and whilst Vista SP1 was rumoured to include some fairly major changes, it mostly conforms to this. The kernel

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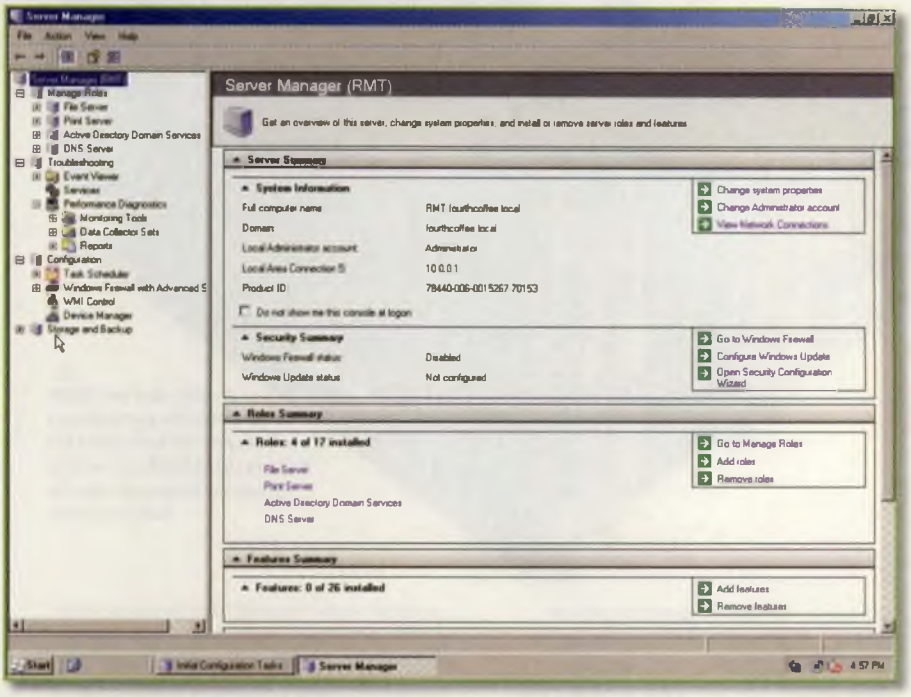
FACT FILE!

Every new shrink in processor feature size creates problems beyond just the difficulty of etching even smaller circuits. In order to make its move from 65nm to 45nm possible, Intel employed a technology called High-K dielectrics allied with metal gates. This reduces the electrical leakage problems caused by transistors only a few atomic layers thick, which would have made processors using transistors this small very unreliable.



The first Windows Vista Service Pack is due at the same time as Windows Server 2008 and will update Vista to the same kernel revision.

will be upgraded from 6.0 to 6.1, the same as the forthcoming Windows Server 2008. Kernel Patch Protection will be altered to make it easier for developers to address. Kernel Patch Protection had been criticised for preventing the likes of Symantec and McAfee from interacting with the OS as closely as they could with earlier versions of Windows. Similarly, Instant Search will play more nicely with third-party desktop search applications. Currently, it remains fully functional if these are installed, sacrificing system performance. But with SP1 it will be possible for third-party vendors to ramp down the Instant Search indexer and take the clock cycles for their own provisions. The final shipping version of SP1 isn't due until early 2008, alongside Windows Server 2008, which has been delayed by around six months.

There has been much talk about WinFS, the next-generation file system which was supposed to be part of Windows Vista. It was included within an early build of Longhorn (build 4051), the codename for the beta of Windows Vista. But performance was slow, so it was removed from later builds. It was then supposed to be a separate software release due to arrive around now. However, this has been cancelled as well. At the time of writing, it appears that the technologies of WinFS have been woven into forthcoming versions of the SQL and ADO.NET relational databases.

So, the grand vision of the Windows File System becoming a relational database itself has turned into a mirage in the cold light of day once again. The first version of the idea emerged as the Object File System in the cancelled Cairo project in the early 1990s, so maybe it's a vision which will never become a reality.

Fortunately, the absence of WinFS won't take the shine of what is shaping up to be an exciting few months for PCs. With AMD set for a native quad-core comeback, and new technologies like DDR3, PCI Express 2 and HyperTransport 3 filtering through in the near future, there's plenty to keep computing as fascinating as it has ever been. And knowing what's in store will help you decide whether to buy now or wait for the great alternative which is just around the corner.

MAC'S LEOPARD OS

THE NEXT GENERATION OF MAC OS X IS DUE THIS MONTH, BRINGING WITH IT A HOST OF NEW FEATURES.

Just as Microsoft is starting to talk about the first service pack for Windows Vista being released, Apple is soon to launch a much more significant update to OS X – codenamed Leopard and numbered 10.5. The successor to Tiger, or Mac OS X 10.4, the new big cat is due to leap onto unsuspecting Mac users this month. Apple alleges it includes over 300 new features.

As always with Apple, many of these are focused on the user experience rather than core technology. Highlights include a new desktop system with a Stacks feature, which allows you to arrange items into containers readily accessible from the desktop, without having to clutter it with icons.

There's an iTunes-style sidebar for accessing files and folders quickly, and Cover Flow lets you flip through their contents. Quick Look will allow you to preview documents without opening the associated application in the Finder. It includes Microsoft Word and Excel files, PDFs and QuickTime video, and can be expanded by third parties.

Time Machine is a new automated backup tool. What differentiates it from similar implementations is that users can retrieve deleted files or previous versions directly from the Finder, or even calendar entries, contacts and email messages. In this respect, it goes beyond Windows Vista's Shadow Copy. The Boot Camp system, allowing you to dual-boot Intel Macs to Mac OS and Windows will be bundled as standard. So now it's even easier to use your existing Mac as a PC. . . or you might just be tempted to go entirely in the other direction.

Mac OS X Leopard contains a host of usability improvements.

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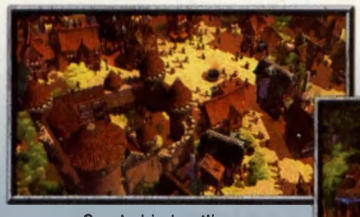

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BIGPOND GAMES

PG Mild violence

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A touch of fusion

You think Vista has some snazzy effects? *Ashton Mills* shows us that that's nothing compared to what Compiz Fusion can do.

Last month we covered a range of must-have apps for most systems. This month we'll take a look at installing and enabling Compiz Fusion and its associated packages to give you a 3D desktop that will really impress the socks off the opposite sex. It may even be useful, too.

WHAT IS COMPIZ FUSION?

Now that's a tricky one. Once upon a time there was Compiz, a compositing window manager developed by Novell. What's a compositing window manager? Well, you're probably aware that the GUI Linux uses — the X Window System — is merely (and by merely I mean pivotal) the display engine, and window managers provide the 'display' a user sees such as window borders and how the interface is used. A compositing window manager takes advantage of OpenGL to create a 3D accelerated interface, and all the joys (read: snazzy effects) this brings.

Compiz eventually forked in September 2006, after a dispute in direction, and produced a startup called Beryl built off the Compiz core, but accelerating development and adding a range of impressive plug-ins. It also introduced the Emerald window decorator to enable easy theming of the accelerated desktop.

In March 2007, the Compiz and Beryl teams got together and decided to merge the projects, and the result is Compiz Fusion — a Compiz core with the Beryl feature set from its plug-ins ported across, and continued development of this single project. At the time of writing, a milestone of 0.5.2 has just been released.

And what can Compiz Fusion do for you? That's better demonstrated than explained, so here's how to get Compiz Fusion installed.

INSTALLING COMPIZ FUSION

Regardless of the distribution you use, installing Compiz Fusion really only takes a few steps.

We'll cover the two extremes here — Ubuntu and Gentoo — but the packages are generally available for most distributions. Use your package manager to search for binaries, or head to **http://wiki.compiz-fusion.org/Get_Compiz_Fusion** for links for SuSE and Fedora.

Before you begin, make sure you have the latest official drivers for your video card, such as the official Nvidia drivers, installed to get properly accelerated OpenGL. There's no point trying to enable Compiz Fusion unless you have hardware accelerated graphics drivers installed (and in fact, it won't run if can't find what it needs).

Generally, you should use the driver packages provided with your distribution, although in a pinch — for Nvidia at least — the official installer works reasonably well for most configurations.

UBUNTU

Ubuntu 7.06 actually comes with 'Desktop-effects', which is essentially Compiz. However, as covered above, since Compiz we've had Beryl and now Compiz Fusion, so it's quite far behind. To install Compiz Fusion on Ubuntu, it's first necessary to add a repository containing binaries for it. Click System > Administration > Software Sources. Click Add and add the following repository:

```
deb http://ppa.launchpad.net/amaranth/ubuntu feisty main
```

Then click Close. Next, open up a command prompt and run the following commands:

```
sudo apt-get remove compiz-core desktop-effects
```

```
sudo apt-get install compiz compizconfig-settings-manager emerald emerald-themes
```

Ignore the warning about not being able to authenticate the packages. We're almost done — Fusion Icon isn't included by default, but a binary can be downloaded from the Ubuntu forums here: **http://ubuntuforums.org/showpost.php?p=3163821**. Grab and install it.

Note that, at the time of writing, the Ubuntu developers voted in favour of bundling Compiz Fusion with the next 7.10 release of Ubuntu, so the above steps won't be necessary in the next release.

GENTOO

Gentoo is also relatively straightforward — a third-party overlay called 'xeffects' contains everything you need to install Compiz Fusion, and the overlay manager 'layman' makes it easy to add xeffects to your portage tree:

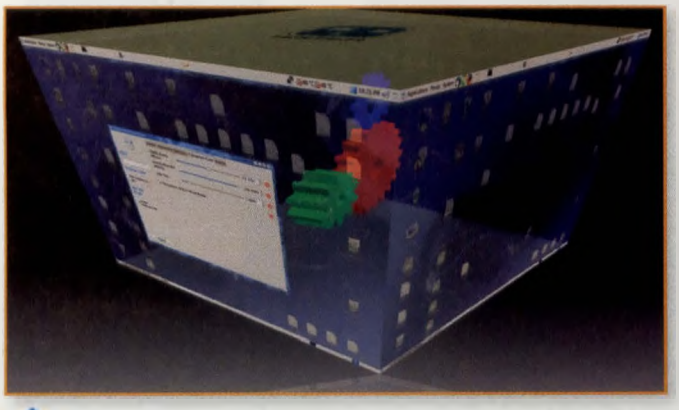
```
emerge layman
layman -L
layman -a xeffects
```

Then, update your make.conf for layman and some required USE flags by running 'nano -w /etc/make.conf' and adding 'glitz svg pdf png' to your USE entry and adding this line:

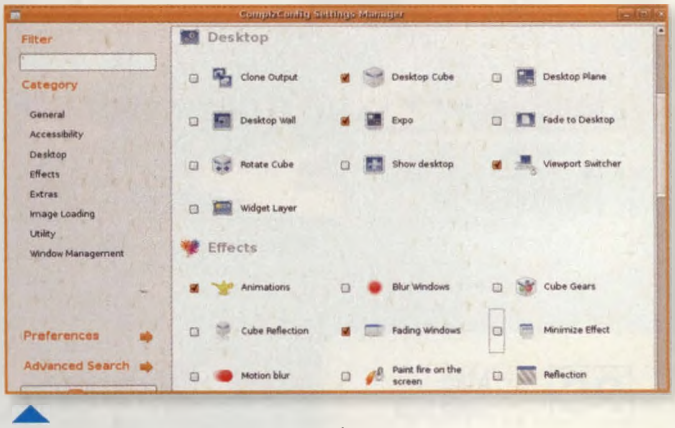
```
source /usr/portage/local/layman/make.conf
```

Save make.conf, then emerge Compiz Fusion:

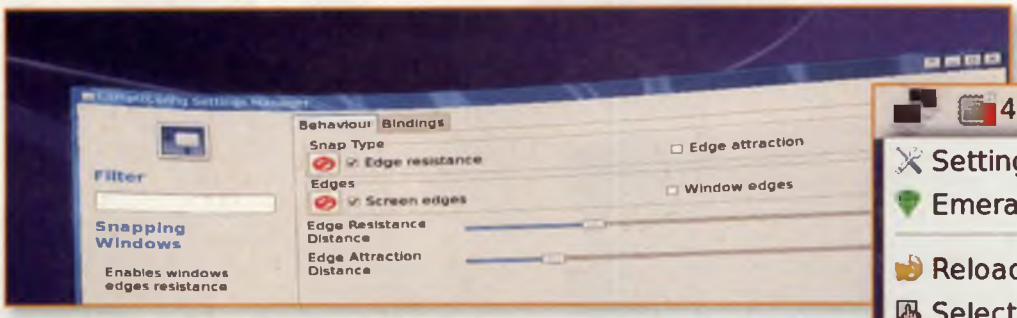
```
emerge compiz-fusion fusion-icon
```



3D-rotating, transparent, reflective desktops. Oooh.



The Compiz Fusion configuration interface.



The magic of bendy windows comes to your PC!

Fusion Icon makes it easy to manage Compiz Fusion.

XORG UPDATES

Finally, there's a few settings you may need to make sure exist in your xorg.conf file. Edit /etc/X11/xorg.conf with your favourite editor and do the following:

Under the section 'Module', add the following:

```
Load "glx"
```

Under the 'Device' section, add:

```
Option "AddARGBGLXVisuals" "true"
Option "AllowGLXWithComposite" "true"
Option "RenderAccel" "true"
```

Under the 'Extensions' section, add this:

```
Option "Composite" "enable"
Option "Render" "enable"
```

STARTING AND EXPLORING COMPIZ FUSION

The easiest way to configure Compiz Fusion is with Fusion Icon. You can start it at the command line and/or add it to your startup so it loads when you login (under Gnome, click System > Preferences > Sessions and then add a New program).

Once executed, you should see a blue icon in your system tray. Right-click it to configure Compiz Fusion.

Start by clicking Select Window Decorator > Emerald. Then click on Emerald Theme Manager. Once it pops up, click Repositories and then fetch some new themes. Browsing the Emerald themes is as simple as scrolling the main Themes window, and clicking on one to enable it. Spend a little time finding a theme you like and selecting it.

Now, click on Fusion Icon again and select Settings Manager. Although laid out simply, there are a *lot* of fun toys to play with in here. Compiz Fusion's effects and features are broken down into modules, and within these you can tailor the operating and configuration of their behaviour.

To set up a relatively snazzy desktop with pretty eye candy that also introduces some new and handy functionality for your desktop, tick the following modules — default keys to activate them are listed below as well, so you can try them out on the fly:

Desktop and Management

- Zoom Desktop
[super]+mouse wheel
- Rotate Cube
Ctrl+Alt+mouse drag
- Expo
[super]+E
- Viewport mouse
mouse2 to rotate
- Application Switcher
Alt+Tab
- Ring Switcher
[super]+Tab
- Shift Switcher
[super]+Shift+S

Effects

- Blur Windows
- Cube Gears
- Cube Reflection
- Fading Windows
- Minimise Effect
- Reflection
- Paint Fire
- Window Decoration
- Wobbly Windows
- Window Previews
- Snapping Windows

Some features deserve special mention or have settings to play with — in Expo, for example, you can drag windows within a desktop from one desktop to another. In Desktop Cube, try setting opacity during rotation to 50% and then rotating the cube. If you have Gears enabled, you'll see them on the inside. The Shift Switcher looks rather like Vista's tiled switcher in 'flip' mode and Apple's CD cover browser for the iPhone and iTouch in 'Cover' mode. Even so, the Ring Switcher and Expo are far more impressive. And then there's Painting Fire — which *is* one of those eye candy features that isn't actually useful, but it is very cool.

Finally, click on General Options at the top and, if your effects are slow, try turning off Vsync (aka. Sync to VBlank) under Display Settings. While you're there, set Texture Filter to 'Best'. In fact, while you're exploring the many options of the modules, you find a number of them have the option to enable mipmaps — do so if you can, as this will soften edges and frequently provide higher image quality. The effect can be seen simply with Window Previews, for example.

There's much more to Compiz Fusion than these impressive visuals — windows can be dragged between desktops by pulling them to the edge of the screen and allowing the cube to rotate. Alternatively, you can hold down Shift+Ctrl+Alt with a window selected and press the arrow keys and the cube will rotate around the window. There are many hidden talents like this, so spend the time exploring all the options (including key bindings, to reveal variable functionality) for each module.

Ultimately, while Compiz Fusion *is* impressive, you'll find yourself settling for a handful of effects and functionality features, as it should be. Eye candy is one thing, but your desktop needs to be productive, too. Explore and find the balance that's right for you.

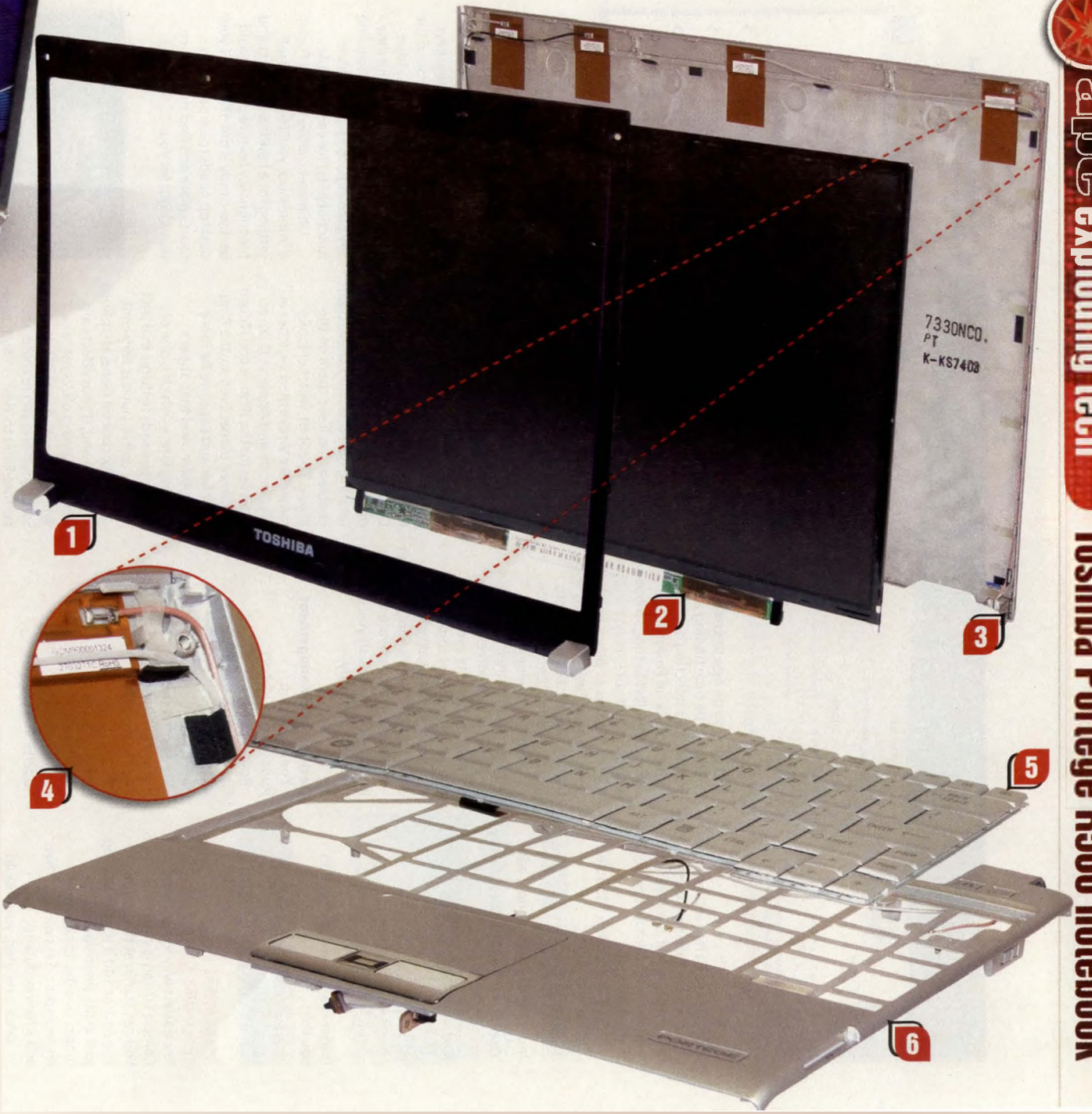
Scroll wheel zooming on the fly.

COMPIZ FUSION AND ITS ASSOCIATED PACKAGES GIVE YOU A 3D DESKTOP THAT WILL REALLY IMPRESS THE SOCKS OFF THE OPPOSITE SEX

Toshiba Portege R500 notebook

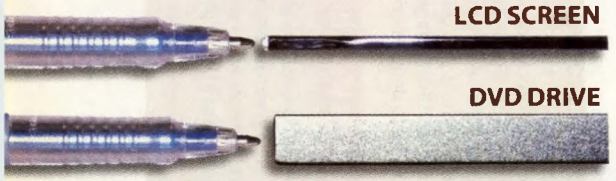
This month, we're exploding Toshiba's Portege R500, the world's thinnest and lightest notebook, with a claimed battery life approaching 12 hours.

1. LCD mask
2. LCD panel
3. LCD top cover
4. 802.11n antenna
5. Keyboard
6. Top cover assembly
7. CPU cooling module
8. Heat pipe (CPU cooling module)
9. Antennas for 802.11n Wi-Fi card
10. Main PCB (motherboard) with VGA/USB/FireWire (iLINK) ports
11. Multimedia card reader (SD controller card)
12. Audio/USB sub board
13. Serial ATA HDD
14. 802.11n Wi-Fi card
15. Real-time clock (RTC) battery
16. 7mm DVD SuperMulti optical device
17. Base cover assembly
18. USB daughter driver board
19. 6-cell lithium-ion battery
20. HDD cover

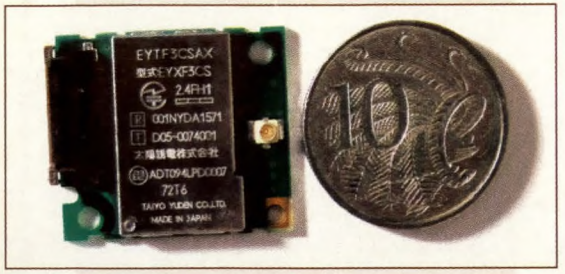


The Toshiba Portege R500 comes with a choice of conventional hard-drive technology or a 64GB solid state drive.

The scale of things



The LCD screen and the newly designed lightweight DVD drive are the thinnest on the market.



The Bluetooth 2.0 module has been reduced in size so that it now takes up the same space as a 10c coin.

APC readers solve your computing problems

QUESTIONS ANSWERED

HARDWARE
84 Space mystery
85 Boot without writing

WINDOWS
84 Slow-booting XP
86 Advanced command line folder manipulation

VISTA
86 Changing your IP address from dynamic to static

LINUX
87 Films without glitches

NETWORKING
87 Two network interfaces
87 Automate changes to DNS server

MULTIMEDIA
88 Rear-projection TV 2

PC readers are Australia's single largest group of tech experts. If you have a technical problem, chances are an *APC* reader can solve it.

HARDWARE

SPACE MYSTERY

Q My computer seems to be losing space on the C: drive. It is partitioned so that C: has just Windows, while my my data is on the G: and H: drives. However, I have noticed that my C:, which is 12GB, has only 250MB free when I turn it on. I am running AVG Anti-Virus to scan for any viruses as I type this email. What should I look at and what should I try to get my free space increased and to stop it dropping?

Greg

A I would recommend that you firstly delete all your temp folders. To do this, run Disk Cleanup in Accessories > System Tools. Let it scan your PC (this may take a while), and then, when it's done, check all the boxes in the list and click OK.

Next, delete all the restore points you have. To delete all the restore points on your computer, disable and re-enable System Restore on the system. Click Start > Control Panel and then the System icon. Click on the System Restore tab in the dialog box, select the 'Turn off System Restore' check box and click Apply. Clear the check box again to re-enable System Restore and then click OK. You can reduce the number of restore points saved by decreasing the total amount of disk space available to System Restore. Note that less available disk space will decrease the relative number of restore points. To defragment your drive, go to System Tools and select Disk Defragmenter. Select the drive you wish to defragment and click Defragment.

For more advanced defragmentation, take a look at Diskeeper Lite, a free and much more powerful alternative to the standard Windows defragmenter.

BY ANTHONY MARKHAM
Anthony is a game developer at Veron Games, which often takes requests from users.
www.verongames.com

WINDOWS

SLOW-BOOTING XP

Q My Windows XP machine has 2GB of RAM but is taking ages to boot because of the amount of programs that load when it starts. Some of these I only use occasionally. How can I make my PC boot faster?

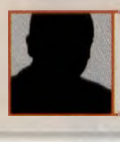
Toby James

A The most-likely cause is that Windows XP is loading too many programs at boot, including programs which may never be used. Windows maintains a list of programs required at boot time in a folder, 'Prefetch'. When booting, XP consults this to load Windows faster by prefetching the applications into RAM. This is done so that when the application is called to the foreground it appears to start more quickly than normal.

The Prefetch folder is partially dynamic. That means the folder is created — but not maintained — automatically. As a result, the Prefetch list can become enlarged with items that are no longer used.

WHAT'S WITH THE READER BOX?

APC will give readers whose answer is highlighted a small promotion box in which they can promote their business with a mission statement or slogan, and a URL or phone number.



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TIP... FIREFOX TIPS FROM AN APC READER

FIREFOX HAS AN EDGE OVER OTHER BROWSERS DUE TO MANY REASONS, NOT THE LEAST ITS VAST ARRAY OF ADD-ONS.

Some of the best add-ons are those that capture streamed videos. The Internet is being swamped with new web sites hosting videos that users submit, and since these videos are streamed through the browser, there's no way of capturing them to your computer to watch later on. I've used many Firefox add-ons that claim to be able to save the videos onto your computer, such as 'videodownloader', but none of them work as flawlessly as 'unplug' does. It can be downloaded at *http://unplug.mozdev.org*. It is able to download videos from over 100 different web sites, including the popular YouTube, Metacafe and MySpace to name a few.

IMPROVING THE BROWSING EXPERIENCE

Another add-on I love is called 'Tab Mix Plus' and can be found at *https://addons.mozilla.org/en-US/firefox/addon/1122*. This add-on has many options to make the browsing experience much better. Have you ever been in a situation where you have queued up four or five tabs waiting to be read, forgetting which tabs you had open? Tab Mix Plus has a 'session manager' where you are able to save and restore browsing sessions. You name the four or five tabs you have open, something like 'reading news before meeting', then close the browser and turn off your computer. When you're ready, open up that session again and all the tabs will open just as you left them. The session manager also has a function to re-open tabs that were previously closed, so if you ever accidently close a tab, it can easily be re-opened with a click of the mouse.

BLOCKING ADS ON DIALUP

Ads, particularly pop-ups, make internet browsing slower for those that aren't on a broadband connection. Sometimes it's even hard to distinguish between the real content and advertisements. The final Firefox add-on I suggest is called 'Adblock Plus' and can be found at *http://adblockplus.org/en/*. When the plug-in is installed, you are given a choice of which advertisement filter you want to subscribe to. The most popular filters get updated regularly, so, not only are the popular ads blocked, but also the new ones. If some ads escape this filter, a simple right-click of the mouse and selecting 'block ad' will add it to the database and it won't show up again.

BY JIMMY TRAN

Jimmy is 21 and currently doing a Mechanical Engineering degree at Monash University. He received his first computer when he was nine and since then has developed a strong interest in computers and the computer industry through self-tuition and experimenting over the past decade. His computer is always being upgraded and tweaked to maximise performance and minimise cost. He enjoys overclocking because of the satisfaction he gets when his cheap CPU is outperforming high-end CPUs.

Controlling USB devices: use this applet to control your USB block storage devices.

Boot time can be reduced by clearing the contents of the Prefetch folder. XP will recreate the contents as required. This 'housekeeping' can be done periodically when XP seems to misbehave. The process isn't destructive and can speed up boot time by 30 per cent.

Another way to shorten XP boot time is to load the kernel into RAM. This simple registry edit gives XP wings, but only with 256MB of RAM or above.

Start Regedit and search for 'HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management\DisablePagingExecutive' and set the REG_DWORD value to '1' and reboot.

HARDWARE

BOOT WITHOUT WRITING

Q We have a PC that we need to boot without making any changes to the disk. Is this possible?

John Dawson

A Booting without writing to the system partition is impossible for Windows. During the boot process, the page file is created on the hard disk and changes are made to numerous files and logs. This is by design and there's no switch in XP to turn these changes off.

If the hard disk is damaged, or if the operating system and files must be left unchanged for forensic reasons, then the disk must be viewed from 'top down'. That's to say, the operating system must be booted without touching the disk itself. This may seem impossible, but there is an open source solution.

LiveView from SEI (Carnegie Mellon University) is an open source extension for the VM Ware server that enables 'top down' inspection in a virtual environment. LiveView is available under the GNU licence from **www.sourceforge.net**.

Download and install the software. LiveView will detect any VM Ware installations and will download and install the VM Ware server if necessary. Choose the image file and the boot

Boot without writing any data: .dd images of a Windows disk can be created with FTK Image Lite.

options, including the option to retain the image state for evidence. LiveView will create a virtual machine for any bootable image or physical disk via USB or FireWire. The operating system and files can be inspected inside the virtual machine without affecting the disk state or the cryptographic cipher encoded in the image.

LiveView can examine third-party disk images only if an additional plug-in is purchased. However, it will read Unix .dd images out of the box. Images of a Windows boot disk in .dd format can be created with FTK Image Lite, available from **www.accessdata.com**. FTK Image Lite can also be used to analyse disks and partitions for evidence.

TIP... DVORAK

MORE READER TIPS FOR DVORAK KEYBOARDS

Being a typical male, I put off learning to touch-type for years; being an engineer, when I finally decided to do it I hunted for the most effective way to type and settled on Dvorak. After much searching for a Dvorak keyboard, I converted my QWERTY (that is rather hard to type on Dvorak, believe me) using stickers from Hooleon: *http://hooleon.com/miva/merchant.mvc?Screen=CTGY&Store_Code=KBH&Category_Code=OV-D*. I converted two keyboards from work and home: the work one is still in use, and at home the keyboard wore out before the stickers gave up – four years'-plus use.

I then fiddled about with the country and language setting to set the type as Dvorak, but, with multiple users on the machine, it became somewhat of an issue as the others all use QWERTY. I then lucked on DvAssist (*www.clabs.org/blogki/index.cgi?page=/ComputersAndTechnology/DvAssist*), which allows switching from the default keyboard layout to Dvorak on the fly. It sits as a tray utility, and by double-clicking the tray icon it changes from one layout to the other. I have set it to run on startup when I log in, and everyone else is happy.

My next step was touch-typing training, and, after hunting through various ones, I ended up using Stamina (*http://typingsoft.com/overview.htm*) as the price is right (free), and it's a hoot.

I'm now touch-typing using generally QWERTY-marked keyboards and carrying around DvAssist on my USB key to let me use Dvorak wherever I happen to be – let's face it, once you are comfortable touch-typing, it doesn't matter what is on the keys.

BY BRIAN HOBBY

Brian is an electrical engineer and challenges you to read *The Weather Makers* by Tim Flannery and *The Omnivore's Dilemma* by Michael Pollan – and then to try not thinking about how far that food in the supermarket travelled and how much carbon is added to the atmosphere each time you go shopping.

VISTA

CHANGING YOUR IP ADDRESS FROM DYNAMIC TO STATIC

Q I've just installed Windows Vista and have been running it OK using DHCP, so that it can get an IP address from the broadband router. However, I changed it so that it uses the static IP address that I want it to use and now, although it will happily browse the web server on the LAN, it won't even go out to Google. What can I do to make this agoraphobic machine work other than make it use DHCP?

Alan Kimm

A Your hardware is working alright because it is able to interact with other machines on your LAN. The fact that it won't step out onto the internet makes it sound as though when you typed in the static IP address into the network card dialog box, that is all you did. DHCP can carry a lot of useful information — much that you can do without. However, the one piece that seems to be missing is an IP address for the LAN's gateway, which, in your case is just the broadband router's LAN IP address. Back in the network configuration dialog box, you need to add this address and probably a DNS server's address or two as well (these should be on your router's configuration pages).

WINDOWS

ADVANCED COMMAND LINE FOLDER MANIPULATION

Q Is there an alternative to the Windows XP copy command? I need to be able to purge directories after copying and to duplicate folder trees without copying the contents.

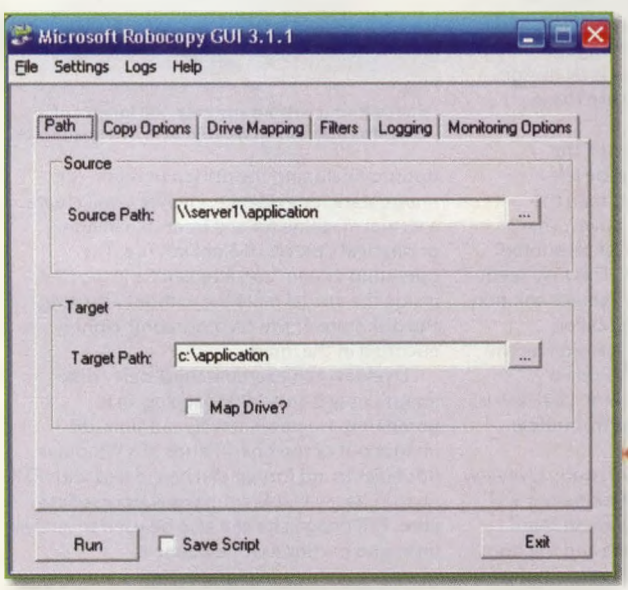
Anne Kalb

A Microsoft published the RoboCopy (seems someone in Redmond has a sense of humour) program on the Microsoft download site a while ago. For a while, this replacement for Xcopy was bundled only with the MS Server 2003 resource kit, but it works just as well on Windows XP and even Windows 2000.

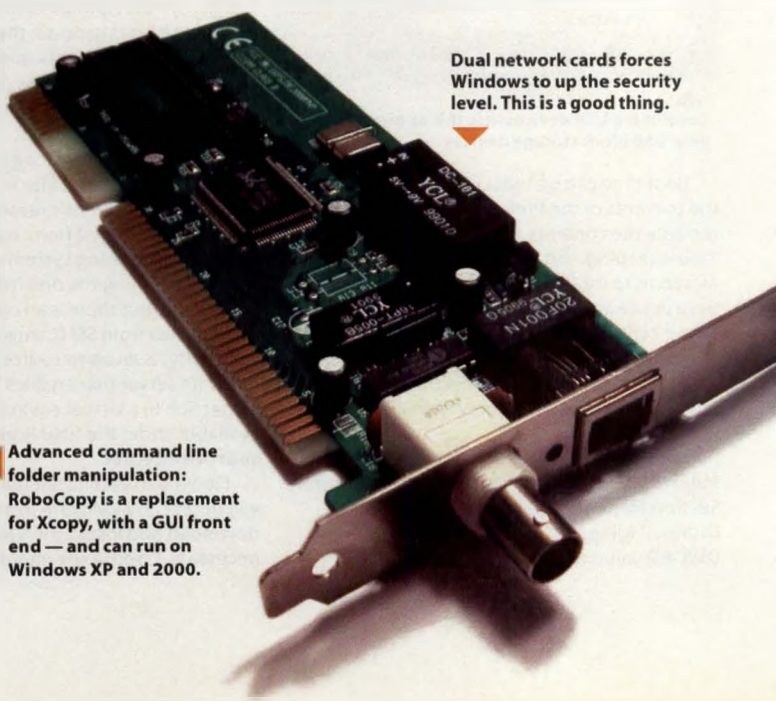
RoboCopy wins over Xcopy in a number of ways, including having the ability to monitor source folders for changes and automatically recopying folder contents after a number of changes have been detected.

The commands have to be typed and can be long-winded, so try Dirk Benisch's RoboCopy GUI. The GUI front end allows a simple selection of each RoboCopy switch, along with the option to save the selections as a command to be pasted into whatever script or program you have available.

Both RoboCopy and the GUI are available from **http://download.microsoft.com**. The GUI is called UtilitySpotlight2006_11.exe, and MS Net Framework version 2.0 needs to be installed on your PC in order to run the program.



Advanced command line folder manipulation: RoboCopy is a replacement for Xcopy, with a GUI front end — and can run on Windows XP and 2000.



Dual network cards forces Windows to up the security level. This is a good thing.

LINUX

FILMS WITHOUT GLITCHES

Q I've got an Intel Pentium III machine that I run Linux on, but when I play DVDs on it, the video is sometimes a bit 'glitchy'. Is there a cure for this?

Matthew Cusworth

A When Linux reads data from a drive, it always checks that it's correct. However, with DVDs, this is not entirely necessary — you won't miss the odd dropped frame — and as checking data also consumes processor power, your system is spending time on that instead of delivering the output you want. The solution to this is to get your system to write directly to memory when you're reading from DVD. You can get this by opening up a console, 'su'ing to 'root' and then typing the following:

```
hdparm -d1 /dev/dvd
```

This sets direct memory addressing (DMA) for DVD, and your processor should be able to concentrate on showing your videos without dropping frames. On faster systems, you will most likely find that glitches do not occur, because there's enough processing power available to do everything. In that case, there is no need to use the above solution.

NETWORKING

TWO NETWORK INTERFACES

Q I have two network cards in my computer. One is plugged into my LAN (which goes to the router via a firewall), and the second can go directly into my router. When I plug in the second lead, all of my network shares disappear from my network folder. Should this happen? What's going on?

Steve Burton

A It should happen, and you really shouldn't do anything to change it. If you have a wireless card on your machine, when you activate that, you should see the same thing happen. The reason is that Windows is keeping your LAN — with all of its shared resources — secure. If you were to change this behaviour, Windows would need to know how to handle two network cards with different firewall properties and routes. It's much safer for the average user not to have to think about this, and for Windows not to give them the option. Opening a dual-homed machine with access to a LAN can allow unauthorised users access to resources (if they compromise any program that has initiated a connection): web browser buffer overflows, plug-ins with vulnerabilities and so on. So it's in your interests not to play around with this — and remember that if you just unplug or disable your second connection, your shares will appear automatically again.

Films without glitches: for older machines, using DMA solves frame-dropping problems.

NETWORKING

AUTOMATE CHANGES TO DNS SERVER

Q I need to automate changes to my 2003 DNS server. Can I do this with a script?

Jack Tims

A The Windows Server 2003 DNS GUI is perfect for most applications. However, if you need to automate changes, such as providing changes or adding access to system delegates without granting access to the GUI, then a script is required. The key to using scripts to automate DNS is a little-known command line tool called DNSCMD. Install DNSCMD as part of the support tools found on the Server 2003 distribution CD. Once installed, DNSCMD may be run from the command line. For example, the first command below lists all records in the zone, and the second one creates a new record (in this case, my server1.virtual.local DNS):

```
C:\dnscmd server1.virtual.local /ZonePrint
virtual. local
C:\dnscmd server1.virtual.local /RecordAdd XP3
A 192.168.0.12
```

There are plenty of useful scripts available to download for this useful tool. DNSCMD can be run from any Windows XP or 2000 PC that is a domain member and that has the Server 2003 support tools installed. And, of course, these commands can be incorporated into batch files and scripts of your own. Have a look at the script at **www.reskit.net/DNS/dnsdump.cmd**. (To view it you'll need to replace .cmd with .cm_.) This backs up your DNS completely, including the portions contained in the registry.

MULTIMEDIA

REAR-PROJECTION TV 2

Q I would like to hook up my media centre PC to a rear-projection TV to watch high definition video, but the TV does not have an HDMI or RGB plug, and my video card does not have component sockets.

Do you know of any PC video cards that would help me? At the moment I can only watch video through a poor S-Video connection.

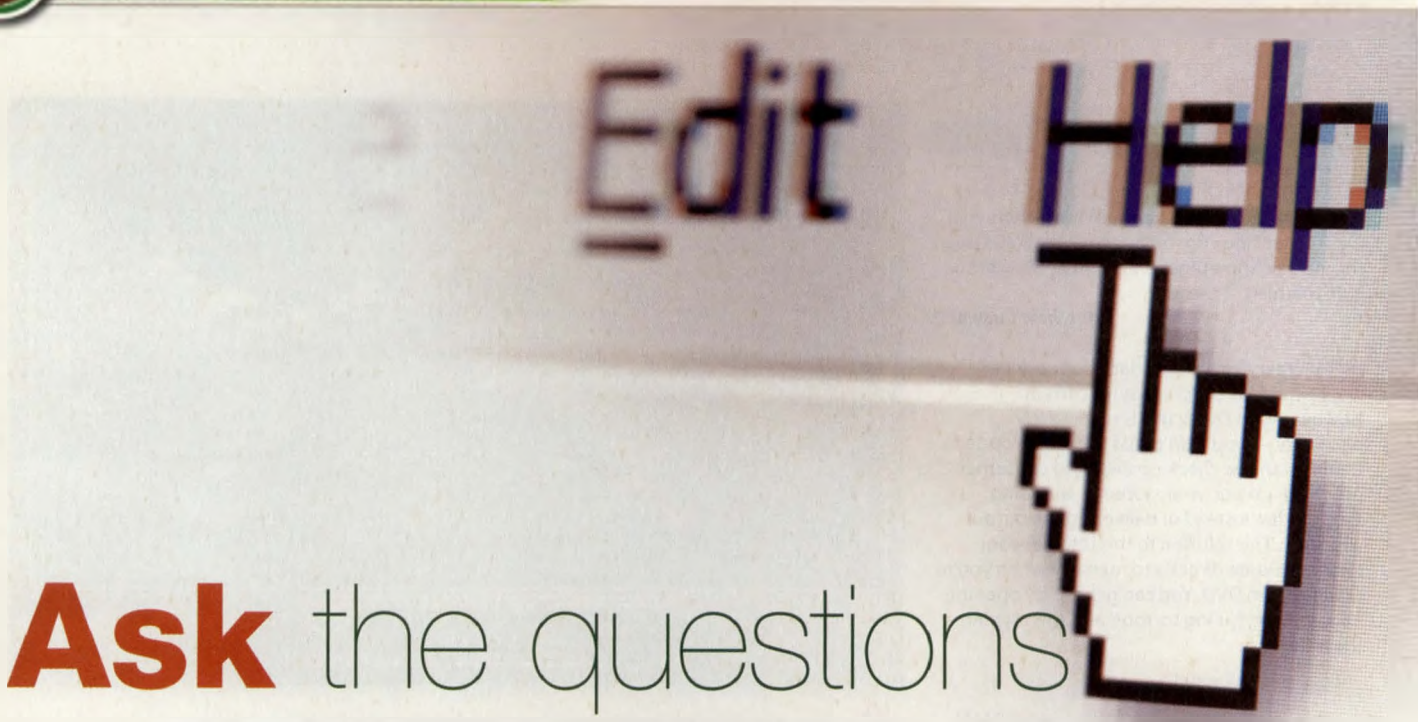
Erik Fazekas

A Assuming that you had just S-Video/RCA, you would not get a true high definition signal on your rear-projection television. If your TV has a DVI input, then that's one way you could create a high definition connection, if your TV supports HD. If your graphics card supports high definition through DVI and your television as well, then go for that method of connectivity.

It would be cheaper to buy a high definition graphics card with DVI and, if your rear projection does not have a DVI input, you may want to try this: **http://store.apple.com/1-800-MY-APPLE/WebObjects/AppleStore?productLearnMore=M9267G/A.**

Otherwise, you may want to try buying a high-quality S-Video cable. It may just be that the cable you are currently using is of a cheaper make, and S-Video quality depends entirely on the quality of the cable you have.

BY CHRISTOPHER JOHNSTONE
Christopher Johnstone is 17 and is studying engineering at RMIT University. **www.callgary.com.au**



Ask the questions

Send your technical questions, for other expert readers to answer, to askapc@acpmagazines.com.au.

Q I have a problem with PDF files. Once I open a PDF using Adobe Acrobat Reader 8, the computer slows down to a standstill and it takes forever to do anything, even after the PDF file has been closed and is not in use. The only thing to do is to restart the computer using the reset button, as it is impossible to do a normal shut-down. Does anyone have an explanation as to why this is happening? I should mention that this only started happening since I updated to the latest version of Acrobat Reader.

Vicky Mcleish

Q Do cheap cables do the same job as expensive ones? (Eg. Does a $20 HDMI cable off eBay do the same job as a $130 one from Harvey Norman?)

Andrew Pryce

Q Windows Mail (the Vista version of Outlook Express) does not support HTTP servers used by Hotmail (and some others). Is it possible to install Outlook Express on Vista?

Les Hill

Q My computer never reboots without giving me the following message: 'CPU is unworkable or has been changed. Please recheck CPU Soft Menu. Press F1 to continue.' Clearly something has gone wrong. It occurred a few months ago. I suspect a power surge? The computer works as per normal, except I have to hit F1 to reboot the computer every time, and then the computer then boots up as per normal?

Adam Kelly

Q I am running Vista Ultimate with 2GB RAM and 1GB TurboBoost on a Laptop (ASUS F3SV AK136G). I want to increase the battery life and reduce boot and restart times. I am intending to manually set a Pagefile size (same min. and max. settings) on the non-boot disk, but I am wondering what size of Pagefile I should set, or if there are other alternatives to using a Pagefile?

What effect will deleting the Pagefile altogether have on performance? I'd be happy to buy up to a 4GB USB drive if this will assist, but will this compete with the TurboBoost? Alternatively, to get to 3GB RAM, I suspect I will have to swap out a 1GB module and get a 2GB module, which would be quite pricey?

Dil Bert

Q My family has four computers on a LAN network, each protected with antivirus/antispyware software. However, I am worried that if one computer gets infected with a virus, it will spread to the other computers on the network. Could this actually happen and, if it could, is there a solution or software package that could prevent it?

Matthew Wun

Answer the questions

If you feel you can answer one of the questions above, please send the answer to askapc@acpmagazines.com.au.

APC will give any readers whose answer is published a small promotion box in which they can promote their business with a mission statement or slogan, and a URL or phone number. Try to make the answer no longer than 200 words, but less is better. If none of our readers can offer an answer to a particular question, we will turn to our list of industry experts to provide a solution for your queries.

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Printing ahead

Advancements in printing technology means small business are taking control of more of their printing jobs.

Until a couple of years ago, in-house printing for small-to-medium businesses meant a world of monochrome documents and the outsourcing of brochures, posters and other marketing collateral to print shops.

But since then, there's been a revolution in business printing. Colour lasers have become affordable for SMEs, and solid ink printers have arrived to deliver high-quality colour in higher volumes. Suddenly, documents and spreadsheets are now appearing in colour, *and* businesses are starting to print their own collateral: even their own business cards.

COLOUR CONTROLS

If just one thing is holding some businesses back, it's a concern that the cost of colour printing can get out of hand. Tom Lewis, the marketing manager for Fuji Xerox printers in ANZ, says some businesses shy away from colour because of a concern that printing costs will balloon. He says: "There is a fear in small business that the cost of printing in colour can get out of control. They don't realise that many printers have a feature which can control the use of colour."

In its own printers, Fuji Xerox calls this feature Auditron: "This enables the administrator to set limits on who can print in colour, or how many colour prints each individual can make." It's available on all Fuji Xerox's DocuPrint printers, but will also be available on a printer expected to be released this month, the DPC 1110, which is expected to cost around the $500 mark.

HP also offers colour controls in its printers. Luke Duggan, the South Pacific commercial and enterprise manager of HP, says: "You can control who in your office environment uses colour, which applications are able to use colour, or which combination of applications and users.

"If you're printing PowerPoint presentations in colour, they can suck up a lot of colour very quickly; that might be OK for a graphics department, but other people may just print them to read and scribble on them." Colour controls will prevent that.

IN-HOUSE MARKETING

Duggan says the advances in printing technology in the last two years, particularly in affordability and colour quality, has led to businesses being able to print at lower volumes at lower cost. This is the key behind the takeover of many printing tasks by in-house marketing.

"We're seeing this in many small businesses. Even suburban vets now have quite sophisticated printing environments, sending out very individualised marketing material — differentiating their dog newsletter to their cat newsletter. Once upon a time, they would have used a third party," Lewis says.

The latest business colour printers are also able to print to a

wider variety of specialty media. Graham Harman is the general manager of OKI Printing Solutions. He says: "In the past, if a business had to do a promotion which needed 1,000 brochures, it would go to a print shop and probably end up buying 5,000 brochures which it didn't need. But with an in-house printer, I don't have to buy 5,000 brochures. I can print just those I want."

Posters and signage are also easier to do in-house, and the quality is comparable to professionally produced ones. Several OKI and other vendors' printers can print to banner paper (specially thick, shiny stock, ranging in lengths from 900m up to 1,200m long).

Another common business printing job that's coming in-house is business cards. Instead of ordering a few hundred each time from the local print shop, a business using a printer that can print dry-peel business card labels needs to only print what's needed — and quickly whip out ones for temporary staff. And it doesn't stop there. Ever noticed those triangular cardboard boxes on restaurant tables with promotional messages on them? They can now also be printed in-house by many standard office printers.

A3 printing is now also becoming more affordable, and here Harman points to the new OKI C8600 as the smallest and lowest-cost A3 colour printer on the market. Costing $2,950, the C8600 can print pages from A6 to A3 in size, handling paper up to 200gsm and banners up to 1.2m long.

SOLID COLOUR PRINTERS

The constant improvements to inks and print heads in inkjets mean that high-quality photos are now possible even in the cheapest consumer inkjets. But, if a business needs high-quality photos — like a real estate agent — chances are it needs lots of them. It will need a printer that can do high-volume colour printing of good quality, and this is where solid ink printers come into their own. They're as fast as lasers and are claimed to be slightly cheaper because they don't use throwaway cartridges, but rather solid ink blocks.

An example is the Fuji Xerox Phaser 8560 (see review on page 92), a solid

> THE LATEST BUSINESS COLOUR PRINTERS ARE ALSO ABLE TO PRINT TO A WIDER VARIETY OF SPECIALTY MEDIA

dramatically
superior
colour
new
Multifunction flexibility with superior colour printing quality.
Powered by LED (more advanced than standard laser), the new C3530 MFP (Multifunction Printer) delivers amazing colour printing quality in a fraction of the time that it takes an inkjet. In fact, it's the fastest comparable MFP on the market! Now add in the flexibility to print banners up to 1.2 metres long and you can see why the C3530 MFP is in a class of its own.
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Look what you can do on an OKI.
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OKI
PRINTING SOLUTIONS

JUST RELEASED BUSINESS PRINTER

Fuji Xerox Phaser 8560MFP

The Fuji Xerox Phaser 8560MFP is a convenient MFP for a busy small office or workgroup. Its functions (excluding copying) are available across an Ethernet network or via USB.

It's bulky and beige – and looks like it was hit with the ugly stick – but what do you expect when a scanner is dropped onto a printer? (It's presentable, if visually unexciting.) The unit is the size of a typical desktop copier and includes duplex printing and a 50-sheet duplex feeder for the scanner/copier/fax. The ink 'crayons' are clean and easy to change.

Software installation is straightforward. 'Walk-up technology' means that, during installation, users can select the printer they intend to use from its front panel, rather than a possibly confusing list of device addresses. This is useful where multiple 8560s exist on the same LAN, or for mobile users who want to simplify access to supported printers. The device is also Bonjour-aware. PCL and PostScript 3 are standard. Windows 2000/XP/2003/Vista and Mac OS X/9 are supported out of the box.

Nominal print speed is 30ppm. We recorded 13 seconds click-to-drop (excluding warm-up) for the first A4 page, with the second page emerging consistent with the rated speed. The main tray holds 525 sheets, with another 100 in the multi-purpose tray. A third and fourth paper tray (550 sheets each) are optional. Other features include booklet printing, PIN-restricted colour printing and automatic erasure of print jobs from the internal hard drive.

Print quality was good, though some characters appeared slightly ragged under a magnifying glass. An all-black page printed far more smoothly than most laser printers, and business graphics came out well with smooth and vivid tones, while photos were more than adequate for office documents. The solid ink technology delivers a gloss finish that not everybody likes.

With a duty cycle of 85,000 ppm, this is a suitable MFD for an office that produces a lot of colour graphics and has outgrown personal devices.

Stephen Withers

SUPPLIER Fuji Xerox
ONLINE www.fujixerox.com.au
PRICE $4,178
VERDICT ★★★½☆

ink printer that comes in a standalone model or a multifunction device. Fuji Xerox's Tom Lewis points out that the reason the colours are better in solid ink technology is that the ink sits on top of the paper, rather than soaking into it, so much truer skin tones and more vibrant colours are achieved.

Lewis says Fuji Xerox's solid colour printers are direct competitors with laser printers and make up around 10 per cent of all Fuji Xerox printer sales. They're ideal, he says, if a business is printing more than 1,000 pages a month (of which more than 20% are colour).

HP's printers cover the gamut of printing technologies, from inkjets to lasers — but at the higher end, its new Edgeline printers are ink rather than laser-based. The Edgelines are designed to deliver professional print colour to businesses with high print volumes (up to 60ppm) and are being sold to everyone from small businesses to governments and corporate. HP claims their biggest breakthroughs are a marked improvement in affordability and performance when compared to previous colour printing technologies for that market segment.

Since they are for higher-end printing requirements, Edgeline printers are not bought standalone, but come with a usage contract

NEW BUSINESS PRINTER

Canon Laser Shot LBP5960

The LBP5960 is a colour laser printer capable of 1,200dpi, with 10/100M Ethernet, USB 2.0 and parallel interfaces as standard. The traditional beige office printer styling does nothing to offset the bulk of an A3 printer.

It comes with a web interface allowing interrogation of status information and control over IP and MAC address filtering, protocols (TCP/IP, SMB and AppleTalk), stored jobs and other settings and features. It is also used to print stored jobs from the 99 'boxes' available for the purpose, though this part of the web interface seemed incompatible with Safari, so Mac users may need to use Firefox.

The LBP5960 includes advanced features such as encrypted print (especially useful for remote printing, and requires the optional hard disk) and secure print (the job is held at the printer until the operator releases it by entering a PIN). The PIN must be entered via the up/down/left/right buttons, which encourages the use of simple and therefore less-secure codes. How much more would it have cost to include a number pad along with a better display?

The standard paper tray holds 230 sheets, and the front flip-down multi-purpose tray (90 sheets) can be used for specialty papers, an alternative size (eg. A4 when the main tray is loaded with A3) or envelopes. Up to three 550-sheet trays can be added. Duplex printing is standard.

Nominal print speed is 30ppm for A4. We recorded 14 seconds click-to-drop for the first colour page, with the second page emerging consistent with the rated speed. The times were the same for black and white. Print quality was very good, with characters appearing smoothly formed even under a magnifying glass. An all-black page resulted in a somewhat leathery appearance and revealed non-printing margins of between 4mm and 6mm on the various edges of A4 paper. Business graphics came out well, and photos were reproduced to a standard more than acceptable for office documents. Paper curl was an issue with A4 pages carrying large amounts of toner.

The LBP5960 is silent when idling except from an occasional whirr, but it's noisy while warming up and printing. Keep it away from your desk.

Stephen Withers

SUPPLIER Canon
ONLINE www.canon.com.au
PRICE $5,567
VERDICT ★★★½☆

Table tents are making collateral that can be printed in-house.

Colour is revolutionising business printing.

in which the user is charged per page, according to how much colour and black and white printing is done.

> IF THE BUSINESS IS CONSTANTLY PRINTING LONG DOCUMENTS, THEN THE PAGE-PER-MINUTE SPEED OF A PRINTER IS IMPORTANT

NEED FOR SPEED

If the business is constantly printing long documents, then the page-per-minute speed of a printer is important. The minimum speed a small business should look for in a printer is around 20ppm colour and 30ppm mono. If the business has more than five people regularly using the printer, the ppm needs to be even faster.

But if the printer is used several times a day to print small documents of five pages or less (which are needed quickly), then the First Page Out speed of a printer is key. It's the time from when you hit the print button to the time the first page rolls out. This can be glacially slow in older printers. It's also where HP has made the biggest gains over the last year.

HP's Luke Duggan points to HP's 'instant on' technology as one of its biggest technological advances in printing over the past couple of years: "It effectively fuses the toner to the paper at a greater speed and lower temperatures. It enables a much more efficient, faster process and it uses less energy."

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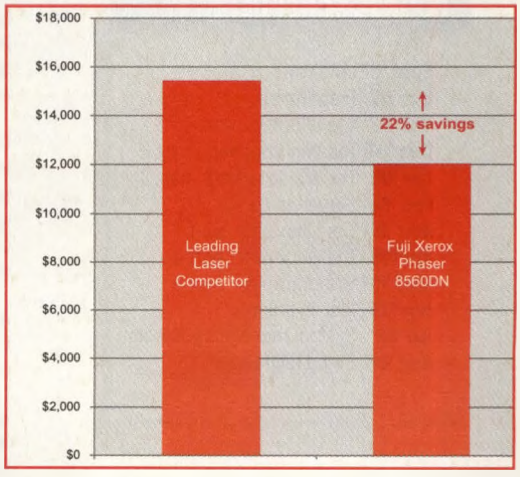
Better for the environment
Solid Ink technology can help the environment and the bottom line. Our printers produce only approximately 2kgs of waste compared to approximately 71kgs for a typical laser printer for every 100,000 pages printed.

Total 5 year running costs*



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* Based on 1,000 A4 mono pages per month at 5% coverage plus 1,000 A4 colour pages per month at 20% coverage

Building a small business network

WHAT'S COVERED

Overview
In this new Masterclass, Jarrod Spiga walks you through the process of setting up a small business IT infrastructure. No IT training is assumed. At the end of the Masterclass, you should know the fundamentals of setting up a server-based network to run any small business.

ABOUT YOUR TUTOR

Jarrod Spiga
Jarrod is an infrastructure architect and data centre engineer for Visionbytes, a company that provides digital video mining technologies and services to some of the world's largest media companies and many government departments worldwide. Jarrod also works as a technical consultant, assisting businesses during infrastructure installation and upgrade projects.

COURSE SCHEDULE

Sept '07 Analysis
Oct '07 Preparation
Nov '07 The Windows path, part 1
Dec '07 The Windows path, part 2
Jan '08 The Windows path, part 3
Feb '08 Server hardware
Mar '08 The Linux path, part 1
Apr '08 The Linux path, part 2
May '08 The Linux path, part 3
Jun '08 Mac in the mix
Jul '08 System management tools
Aug '08 Swing migrations

You might be handy with a PC, but what if you had to look after the back end of your business? How would you set up and manage the servers, the network and the server applications?

Part 3

Starting with Small Business Server

If you've decided to use Microsoft Small Business Server on your server, there will be more to your deployment than just installing Windows.

For a small business, the server is the heart of the network, and the operating system that runs on that server is akin to its soul.

If, during the planning process, it was determined that installing Windows Small Business Server 2003 on your server would be the best bet for the long-term administration of your infrastructure, this and the next two parts of this series will detail what you need to do to get up and running.

However, if you wish to walk the Linux path, there are still a lot of lessons to be learned — infrastructure management techniques are the same regardless of what tools or operating system you use. In three issues' time, the specifics of running a small business using Linux and open source tools will be covered.

A TWO-PHASE INSTALLATION

Essentially, there are two phases to a base installation of Microsoft Small Business Server. The first phase involves the installation of the core operating system (Windows Server 2003), while the second involves installing the additional Small Business Server components (Exchange 2003, Sharepoint Services, Shared Fax Services). Both phases of the installation are completed with the Microsoft Small Business Server media (either five CDs or one DVD, depending on your media kit). This point may sound obvious, but it does require re-enforcing (especially for Microsoft Action Pack Subscribers). You cannot install the SBS components on to pure Windows 2003 Server.

The core operating system installation is a relatively 'next, next, finish' affair; anyone who has installed Windows from a CD should be able to install the OS components with ease. During the installation, you will have to define your regional settings, enter in ownership details, the product key and administrator password, and finally set the date and time.

The one area that may trip users up is in relation to the server hardware. As mentioned in the last issue, many OEMs provide quick-start CDs that contain the drivers for your server. Attempting to install Windows without using the quick-start CD can often be problematic (especially if your Windows requires drivers in order to see your RAID partitions).

After the operating system installation phase is complete (and all support-related software has been installed by the quick-start CD installer, if you used one), your server should reboot and the regular Windows 2003 Server login screen should appear. After you log in using the Administrator credentials, Microsoft Small Business Server Setup commences.

MEETING REQUISITES

Before the SBS components are installed, a quick requirements check is executed to ensure that your server meets the minimum specification required to run SBS effectively. If any requirements have not been met, you can double-click on the message in question to obtain more information on what you can do to meet the requirement.

Many users encounter the 'This computer has only one network adapter' information message. While SBS does not necessarily require two network adapters, this message serves as a reminder to configure the firewall of any router or gateway appliance that you're using so that relevant SBS services are able to be reached from the internet — and the rest of your network is appropriately protected from nasties online.

Specific instructions on how to configure your gateway appliance will vary depending on which appliance you're using. General firewall configuration information for SBS can be found at **www.microsoft.com/technet/prodtechnol/sbs/2003/plan/gsg/appx_c.mspx**.

SBS itself can act as a gateway device if you wish. However, in order for it to do so, you will need two network interfaces in most cases.

PROVIDE YOUR DETAILS

Once the setup process knows that your server has what it takes to run SBS, you'll need to provide the setup applet with information relating to your business. Put the tin-foil hat away — this information is not sent to Microsoft or anyone else for that matter. Most of this information is used to create templates for user accounts, mailboxes, the fax service and other SBS features.

Once this information has been entered, you'll be asked to configure your internal domain information. The setup application recommends that you use a .local suffix for your domain name. As mentioned in last month's article, this is not necessarily a good idea — especially if you're planning on using Mac OS X systems on your network. A generic, non-public domain name avoids many namespace issues that small businesses are likely to come across.

ADDRESS NETWORKING

Next up is the network configuration. Due to the number of services that SBS runs, a static IP address needs to be provided. At this stage, it is appropriate to have a quick think about DHCP.

If you already run a DHCP server (such as on your gateway appliance) and want to keep using this DHCP server, you'll need to configure it so that it doesn't try to assign the address used by your server to another host on the network. Once you've made this configuration change, enter the reserved IP address into the setup application.

On the other hand, if you aren't going to use DHCP or plan on using the DHCP service included in Windows Server 2003, enter in any currently unused IP address and continue.

Once you've completed this step, the setup application has obtained almost all of the information that it requires to install the SBS components. The installation of these components does require a couple of reboots, so the next screen asks you whether you want to supply your administrator password so that the setup process can continue seamlessly after each

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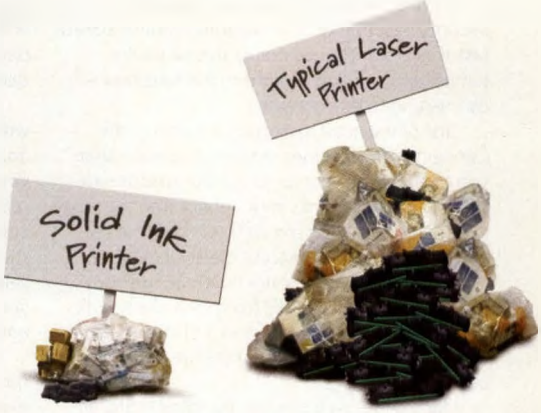
Save 'thousands' over 5 years
The Total Cost of Ownership (TCO) of running a printer also includes the consumables. Our Solid Ink Technology range can deliver staggering savings of up to 22% when compared to a competitive laser product.



*2kgs vs. *71kgs

* Landfill waste for every 100,000 pages

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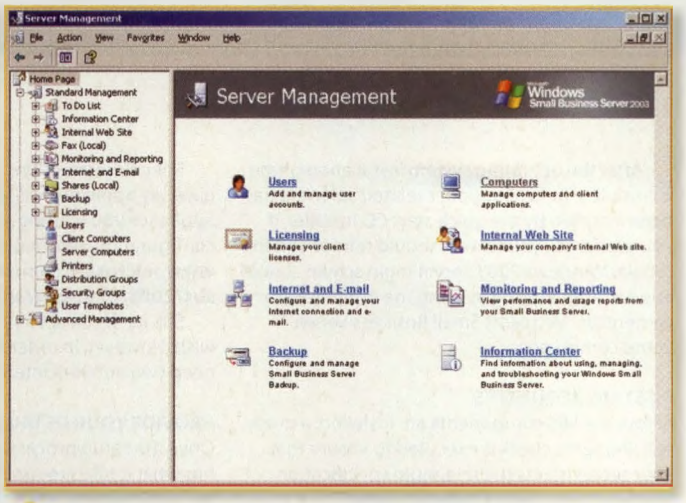
The to-do list: you don't have to stick to the order like gospel, but you should perform every task on this list eventually.



Centralised administration: the Server Management Console provides all SBS administrative tools in the one interface.

reboot. Entering your Administrator account credentials at this point does not log on automatically after the setup process has been completed, but does allow you to go away for a couple of hours while all of the SBS components install. If you don't enter in the password at this point, you'll need to check the progress of the installation regularly in case the system has been rebooted and is waiting for you to log back on.

Now, click the Next button a couple of times (approving just which SBS components you'd like installed) and go and have a break!

THE TO-DO LIST

Upon the successful completion of the installation of all SBS components, you'll be greeted with a to-do list. The purpose of this list is to step you through the final configuration tasks that were not covered during installation.

The first networking task is to view the Security Best Practices — a purely reading-based task that is worthwhile doing, even if you're tempted to just skip straight to the next task — connecting to the internet.

One of the most important aspects of the Connect to the Internet wizard is to ensure that you configure the server to use the appropriate setting that represents your networking topology and that you only set the web services that you want to have publicly accessible as being that.

If you have two network interfaces on your server, and internet traffic from your clients will pass through the server, the wizard will guide you through the configuration of the firewall that is built in to SBS.

Many of the web services bundled in SBS are accessed via an SSL connection — a web server certificate is used to verify the authenticity of the server that clients communicate with. It is by no means a compulsory requirement to install an SSL certificate that has been generated from a trusted authority — even though this can simplify things for end users who do not understand the distinction between authentication and authorisation. SBS can create a self-signed certificate which is adequate in most cases.

EXCHANGE

In most cases, you will want to instruct the wizard to enable internet email. Selecting this option configures the Exchange server running on your server to send and receive email via SMTP. However, it is crucial to configure Exchange to send outbound email correctly. The default option is to use DNS to route email. With this option selected, your server connects directly with the destination SMTP server to deliver a message.

> THE FIRST NETWORKING TASK IS TO VIEW THE SECURITY BEST PRACTICES – EVEN IF YOU'RE TEMPTED TO JUST SKIP IT

The problem that many users encounter with this setting is due to restrictions that are imposed by their ISP. As a proactive spam and virus mitigation measure, many ISPs prevent their customers from establishing outbound SMTP connections. If your ISP enforces this policy, the default settings will not work. You'll need to select the 'Forward all email to email server at your ISP' option and populate the field with the address to your ISP's SMTP server.

For email retrieval, it makes sense to enable the Microsoft Connector for POP3 mailboxes, even if you don't plan on using it (it's better to have the option available should the need arise, as opposed to having to run through this wizard again once your server has gone into production). The POP3 connector allows you to configure Exchange to check a POP3 mailbox and download any messages to individual Exchange mailboxes — a very handy feature if you plan on using an external hosting service to provide additional email redundancy.

Once the retrieval options have been set, you can configure Exchange to remove attachments containing certain extensions in their file name. Doing so for various extensions is good security practice — no matter how much you tell end users never to open .exe files that have been sent via email, it only takes one user an instant to forget, spreading a potentially catastrophic worm on your network. Remove (or at least quarantine) suspect attachments and save yourself a weekend of work later.

YOUR FIRST GROUP POLICY SETTING

After you've settled on what attachment extensions you're going to filter out from your clients, the wizard will then go about its business of modifying all of the relevant settings on your server. At the end of this process, you should then be asked whether you want to enable password policies.

It's always a good idea to enforce a password policy that is secure but reasonable. Enforcing minimum password lengths of 20 characters is not reasonable, because users will get frustrated at having to regularly enter long passwords. Similarly, forcing users to change their password every week just forces them to write their password down — which defeats the purpose of having a password in the first place anyway.

Enabling all three options with the default settings are a good starting point for your

password policy, but be aware that the policy may need tuning over time. (If you need to make changes to the policy at a later date, you can do so by clicking Start > Administrative Tools > Domain Security Policy and expanding the Account Policies branch.) The other thing that you will need to educate your users on is what the complexity requirements are for passwords on a Windows domain. Such a strong password is one that adheres to the following criteria:

- At least six characters long (contrary to popular belief, extremely long passwords are statistically not as secure as passwords that are exactly seven or fourteen characters long under Windows, due to how the password is encrypted).
- Contains at least one character from three of the following five categories:
  - English upper-case characters (A, B, C etc.)
  - English lower-case characters (a, b, c etc.)
  - Base 10 digits (0 – 9)
  - Non-alphanumeric characters (!, @, #, $ etc.)
  - Unicode characters
- Does not contain three or more characters from the user's account name.

After the password policy has been created, ensure that you're connected to the internet and start updating your server via the Windows Update web site (or alternatively, configure automatic updates).

FINAL NETWORKING TASKS

The next item on the agenda is configuring remote access (meaning dial-in or VPN access to your network, not being able to remotely administer the server via a remote desktop connection). However at this stage, it's more of a concern to get your server to the stage where users can start work, so we'll come back to this in a couple of issues' time.

The last networking-related tasks that you have to perform are the activation of the server and the addition of any extra client access licences (over the five CALs that come with retail versions of SBS, if you require them). In regards to CALs, there are two licensing models available for SBS — per user, and per device. You can choose to use both licensing models on your network, but your licensing requirements are easier to identify if you simply stick to one model or the other. In general, if you have more users than devices, you'd use the per device licensing model. If you have more devices than users, the per user model would cost less.

A licensing FAQ for SBS can be found at **www.microsoft.com/windowsserver2003/sbs/evaluation/faq/licensing.mspx**.

Once your server and the CALs have been activated, close the to-do list. Even though there are more tasks to perform, these can (and will) be done later.

THE SERVER MANAGEMENT CONSOLE

The one place where you change almost every setting under SBS is via the Server Management Console (SMC). Those that have solid experience using a native Windows 2003 server should continually remind themselves to use the SMC instead of some of the tools that they are familiar with, unless they are confident that the modifications that they make to system settings will not have an adverse affect on the console.

This tends to go against conventional wisdom, but SBS was designed be able to be managed by people with fairly limited systems administration experience. If an administrative contractor comes in and 'breaks' the console, day-to-day administration tasks may become more difficult.

The SMC can be loaded directly from the Start menu.

ADDING CLIENT COMPUTERS

In a typical Windows 2003 Domain, client computers are joined to the domain by logging on to the client and going through the System properties dialogue in Control Panel. In an SBS domain however, a slightly different process is used.

To add a computer to the domain, load up the SMC, select 'Client Computers' and run the 'Set Up Client Computers' wizard. When you complete the wizard, a computer account is created on the domain, and you'll be instructed to load up a web address on the client computer. Doing so will install various client components on the system (the latest service packs for Internet Explorer, Outlook 2003, the shared fax client etc.) and adjust various settings on the client that allows tighter integration with various SBS components.

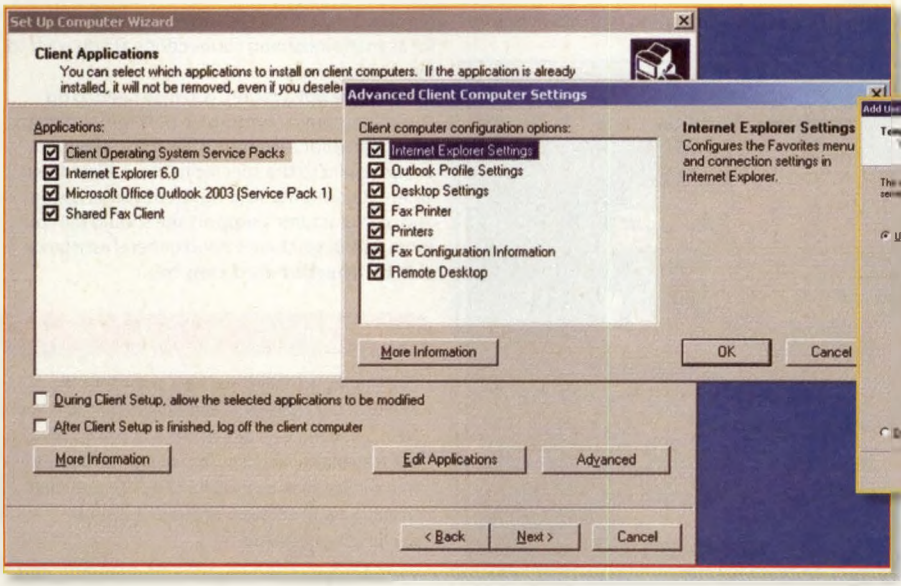
ADDING USER ACCOUNTS

A similar process is used for adding user accounts — select the 'Users' category from SMC and start the 'Add a User' wizard. Essentially, the wizard-created user account is based on pre-defined templates. As a result, an Exchange mailbox, home folder, Sharepoint access and disk quota entries are configured for the user in addition to their account.

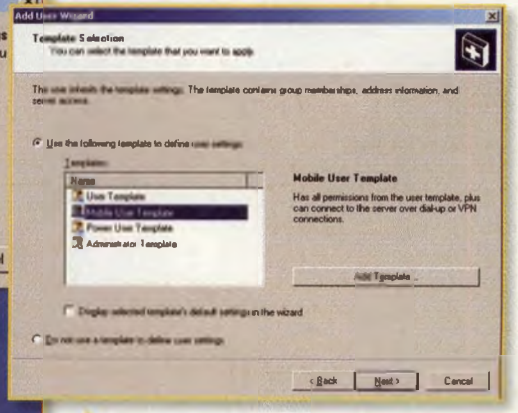
There are four pre-defined templates that you can choose from. In escalating level of permissions, they are User Accounts, Mobile User Accounts, Power User Accounts and Administrator accounts. When creating your account, a description of each template is provided, allowing you to select which template is the best fit for the account that you're creating.

NEXT MONTH

In next month's Masterclass, we'll go back to the to-do list and set up VPN connectivity, shared printers and fax, and an automatic backup schedule.


Set Up Computer Wizard
Client Applications
You can select which applications to install on client computers. If the application is already installed, it will not be removed, even if you desele
Applications:
Client Operating System Service Packs
Internet Explorer 6.0
Microsoft Office Outlook 2003 (Service Pack 1)
Shared Fax Client
Advanced Client Computer Settings
Client computer configuration options:
Internet Explorer Settings
Outlook Profile Settings
Desktop Settings
Fax Printer
Printers
Fax Configuration Information
Remote Desktop
Internet Explorer Settings
Configures the Favorites menu and connection settings in Internet Explorer.
More Information
OK
Cancel
During Client Setup, allow the selected applications to be modified
After Client Setup is finished, log off the client computer
More Information
Edit Applications
Advanced
< Back
Next >
Cancel

The Set Up Computer Wizard provides a mechanism for the automatic deployment of apps and configuration settings to workstations.



Pre-defined user templates cater for the quick and easy provisioning of user accounts.

Supercharge torrents

Torrents aren't just for downloading. They're a useful way to share large files of your own, too. *Mike Williams* shows you how.

WHAT'S COVERED

- **OVERVIEW**
  We explore BitTorrent to see how it can be harnessed to improve download speeds.

REQUIREMENTS

- **PC WITH A BROADBAND CONNECTION**
  To share files effectively you'll need a PC.
- **A TORRENT CLIENT**
  This is also crucial. µTorrent is ideal for private file sharing, and you'll find a copy on the net.

Most people know how to use torrents to download music, video, or even that TV program they missed yesterday — but there's another side to the tech that gets far less attention: creating torrents to share large files of your own.

Maybe you're in the habit of using a file-hosting site such as RapidShare, but consider the advantages. You'll have no file size limits to worry about. No arbitrary rules governing how long your file is available. No pop-ups, no hassles about paying for 'premium' services, no artificial delays before downloading can begin. No slow speeds when the server is busy (you'll probably be able to utilise all your bandwidth). No problems resuming if you lose the connection, and no worries about uploading possibly private files to someone else's site.

Could you host the file on your own site? Maybe, but if you want 50 people to download a 2GB file then you'd better have a sizeable bandwidth allowance. Opt for a torrent instead and the bandwidth requirement is shared by everyone downloading, a much better idea. And best of all, creating torrents requires much less effort than you might think.

PREPARATIONS

If you're new to torrents, then we'd recommend that you start by downloading one or two before you get into the business of creating your own. µTorrent (**www.utorrent.com**) is a small and simple client, for instance, while Azureus (**www.vuze.com/app**) is popular, too. Download and install one, then use a search engine such as Mininova (**www.mininova.org**) to check that you can use your new client to download something. (It doesn't matter what — just pick something small, one of their PDF books say, click the Download link and see what happens.)

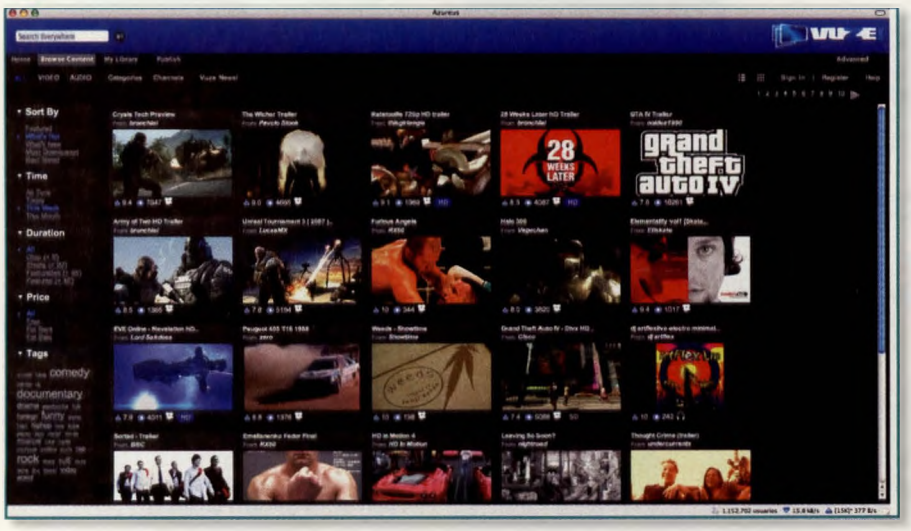
If it doesn't work or is very slow, your firewall is the likely cause. Check that it's allowing the torrent client to communicate with the outside world — to get decent performance you'll also need to open outgoing ports.

With the Windows XP firewall, for instance, click Control Panel > Network Connections, right-click your net connection and select Properties > Advanced > Settings. 'Don't allow exceptions' shouldn't be checked, and your torrent client should be listed under the Exceptions tab.

Next, click Advanced > Settings > Add, enter an obvious description like 'Azureus', and 127.0.0.1 as the 'Name or local machine' (this means the PC you're working on). Check your torrent client documentation or Preferences dialog to discover the incoming ports it needs, then enter one of them here, in both the Internet and External Port number boxes. Click OK and repeat the process for as many incoming connections as you want to be able to handle.

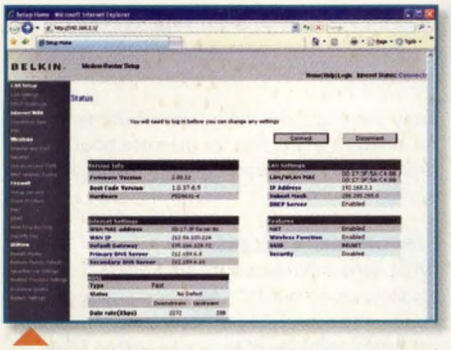
If you've got a router, you may need to do something similar, setting up port forwarding to route traffic for the range of ports used by your torrent client to the specific network IP address where it's running. Your router documentation and manufacturer's support site should tell you more, although there's good general assistance at **http://portforward.com**, too.

Azureus Vuze is focused on downloading files, but click Advanced and you'll find options to share them, too.

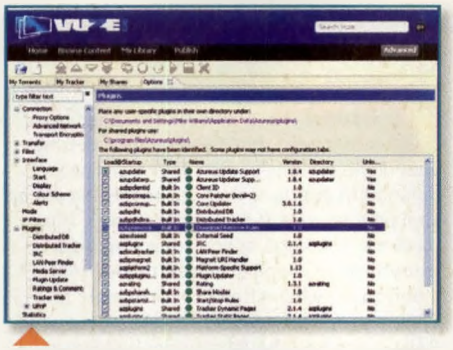


HANDY TIP

File sharing is tricky if you have a dynamic IP address: if it changes in mid-upload (because you have to reboot, say) any clients still downloading will lose the connection. The solution is to use a free service such as DynDNS (*www.dyndns.com*) to map your IP address, whatever it is, to an unchanging hostname.



Your firewall and router will need to be configured for any torrent client before it'll work correctly.



Take the time to tune your torrent client settings and you could get much better performance.

HANDY TIP

When you first start uploading (or downloading) a torrent, it might look like nothing is happening, but don't panic. Not yet, anyway. It can take a while to contact a tracker and start the download, then speeds will be slow initially anyway, before ramping up to (hopefully) use all your bandwidth. There's no need to start tweaking things if that's happening to you: it's perfectly normal.

IF YOU'RE DOWNLOADING DURING THE DAY, MAKE SURE YOUR FRIENDS STAY CONNECTED TO HELP SHARE

THE .TORRENT FILE

The first step in sharing anything is to create a .torrent file for it. Usually just a few hundred bytes, this contains details about the file, the tracker you're using (if any) and other information that will help others access it. Most clients have an integrated function in order to create a .torrent file for you, so the chances are you'll have to look no further than the File menu to discover an option like Create New Torrent.

In µTorrent, for instance, you then have to specify which file or folder you'd like to share. This isn't like regular uploading, so think carefully before you use a zip file. If you're sharing large files that are already highly compressed (JPEGs, video) then zipping them up won't reduce their size much. But worse still, once a friend has completed the download, they may unzip the contents, then delete the original archive, which means they can't continue to share it with others. Unless you're sharing files that can be reduced considerably by compression, it's usually better to avoid archiving and use the original formats. Now enter two or three trackers from the list you discovered earlier into the Trackers box, each one separated by a blank line. (Entering more than one prevents file sharing failure if one of the trackers goes down.)

If you've had problems finding a tracker, or just want to keep the process entirely under your control, then you can always use µTorrent's built-in tracker. Enter 'http://your.ip:port/announce' in the tracker box, where 'your.ip' is your Internet IP address, and 'port' is µTorrent's incoming port. If you don't know what that is, close this dialog, then click Options > Preferences > Connection to find out. Choose the Advanced section while you're there, set bt.enable_tracker to 'true' to turn this on, then click OK and select File > Create New Torrent to repeat the process.

Check 'Start seeding' if you'd like others to be able to access the file right away, then click Create and save as, and specify a name and location file for the torrent file you'd like to create. And that's just about it: the tricky part is done.

START SHARING

µTorrent users should find their client is now already seeding, which means it's ready to start sharing whatever files you've specified. If you're using another client then you may need to open the .torrent file you've just created before it'll act as a seed. You can't share anything with anyone until they have the required details, but then that's what the .torrent file is for. Work out your list of recipients, then send the .torrent by email, Windows Messenger or a floppy disk in the post. As long as they have a properly configured torrent client, launching the file will connect them to the tracker, which will then point them to you, and they can begin downloading. The more people who join in, the better the performance (and the less the bandwidth load on your PC), so try to ensure your friends are all downloading at more or less the same time. If it's a really large file, several gigabytes perhaps, then arranging for everyone to download overnight on a particular date would be ideal.

If you're downloading during the day make sure your friends stay connected, even when they've got the complete file, to help share it with everyone else at the best possible speeds. But even with this help, you'll still probably be providing more bandwidth than anyone else, so make sure your torrent client is using as much as you can spare. In µTorrent, for instance, click Options > Preferences > Connection and set Maximum Upload Speed to zero. This lets the client use every scrap of bandwidth available.

That's important, as the faster you get your file data out there, the sooner connected torrent clients can start to share the load and the quicker the whole process will be over. (Some people do say your upload speed can occasionally be too high, so feel free to try different settings and see what results you get.) It takes an amount of work to share your first file, but, once you're familiar with the basics, it becomes something you can set up and run in just a minute or two.

DO THIS... GET BETTER TORRENT PERFORMANCE

Torrent speeds can sometimes be poor, but there are ways to improve things. Check to see if your ISP restricts file sharing traffic, for instance. If it does, try changing the incoming port in your torrent client to something outside its usual range, such as 22903.

Confirm that your firewall and router are properly allowing all the incoming and outgoing connections you need. Try another software firewall, just to see what happens, though be aware that you should never run two firewalls at the same time. Use the testing tools in your torrent client to check settings and look for problems (click Options > Speed Guide in uTorrent, Tools > NAT/Firewall test in Azureus).

Tweak your broadband connection to ensure it's running at peak performance, and encourage those who are sharing your files to stay connected once they've got a full copy, to help share the bandwidth load. Ask about the speeds they're achieving, too: perhaps their connection needs optimising more than yours.

Professional RAID results

In the first of a two-part series on RAID, *Alan Dexter* looks at how to set up RAID for a faster system.

WHAT'S COVERED

- **OVERVIEW**
  We explain what RAID is, where it's useful, and show you how to set up your own RAID array for speed.

REQUIREMENTS

- **AN UP-TO-DATE MOTHERBOARD**
  RAID controllers have appeared on motherboards for years now, hitting the mainstream just as SATA was introduced. The likes of Intel, Nvidia, AMD and VIA all integrate RAID controllers in their motherboard chipsets, making this an easy feature for motherboard makers to sell.
- **A PAIR OF HARD DRIVES**
  While not essential (you can use older ones), a matched pair of drives offers the best combination of reliability and performance.

Hard drives have increased in speed over recent years, but if you're still accessing your drives discretely using your machine's default ATA interface, then you're missing out on vital performance and reliability boosts. This is particularly strange, as you've probably got everything you need to at least try out RAID, if only to see what difference it can make to system performance. Here's a rundown of what RAID is, why you should consider building an array yourself, and how easy it is to build such a configuration.

RAID stands for Redundant Array of Inexpensive (or Independent) Disks, and covers a number of methods for splitting or duplicating data across several physical hard drives. There are many different implementations of RAID available, all offering distinct benefits across a broad spectrum of disciplines, but one thing they all have in common is that they combine several physical hard drives into a single logical unit. Traditional RAID required specialised hardware, and so was the preserve of system administrators, but this is no longer the case.

The modern interpretation of RAID is often understood to cover pure performance configurations, although there's no inherent redundancy in such schemes, so purists dismiss certain arrays as not being RAID; this hasn't stopped such arrays being popular though. One of the most often seen configurations for boot drives in professional workstations is to have the operating system and applications on a striped RAID array. All the user data is held on a single physical hard drive, or more commonly, on an array offering more redundancy, but there's no inherent protection for the main boot drive (other than a drive image for a quick system rebuild).

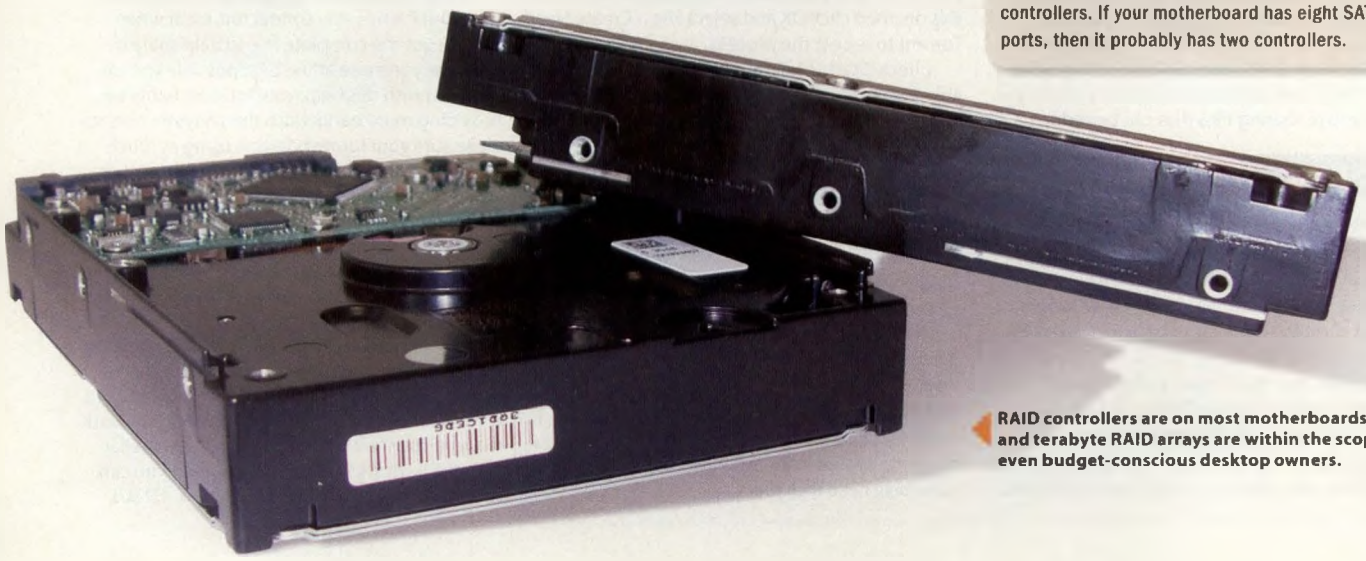
PERFORMANCE ACCESS

What we're talking about here is basic striping, also known as 'RAID 0'. Striping is a fairly simple concept to comprehend, particularly if you start off by just thinking of two drives in the array. Instead of data being written to a single hard drive at a time, the data is broken up into two fragments and written to both drives at the same time. This essentially doubles the bandwidth of the logical drive in comparison with the physical drives. As you increase the number of drives in the array, the overall performance increases.

RAID 0 must be used with care though, because not only does it fail to offer any kind of implicit redundancy, it offers worse reliability than a single drive. If one drive were to fail, then the whole array becomes corrupt, as there's not a complete data set to access, or indeed a way of recreating the lost data. The more hard drives

HANDY TIP

Check your BIOS to make sure that you have your RAID controllers turned on in the CMOS configuration utility and that you have connected the drives you are looking to make into a RAID to the same controller – each controller is either limited to supporting a pair of connectors, or, if it's a more up-to-date motherboard, four controllers. If your motherboard has eight SATA ports, then it probably has two controllers.



RAID controllers are on most motherboards now, and terabyte RAID arrays are within the scope of even budget-conscious desktop owners.

DO THIS... BUILD A BOOT ARRAY

There are a number of reasons why it's a good idea to have a striped array for your main boot drive. The most obvious is that the operating system will load a great deal quicker; a secondary effect is that any applications that you have installed on the main boot partition also benefit from the increased bandwidth. While this is fantastic for normal day-to-day use, it's particularly welcome if you commonly use some of the larger applications.

The biggest benefit though is the speeding up of access to the swap drive – one of the major bottlenecks of modern, multi-tasking computing. Dropping down from high-bandwidth memory to a slow physical medium is never going to be quick. A RAID 0 array for your main boot drive makes sense here. If you store your data on a normal drive, then the increased risk from drive failure shouldn't be a problem.

you use for your array, the higher the chance that you'll experience a single drive failure, which is why most normal arrays, even at the workstation level, limit such configurations to a pair of drives.

It's obvious that there's a need for a configuration that offers the speed of RAID 0, but with some redundancy in case a drive does fail. RAID 5 offers such a solution, and somewhat surprisingly, this is now included as standard in all of the major modern motherboard chipsets, and is even often bolstered by an additional controller by most higher-end motherboards. RAID 5 spreads data across the drives for the performance increase but also writes parity information to the drives at the same time. The downside to RAID 5 is that it requires a minimum of three hard drives, and the logical array is two thirds the total capacity on offer.

When it comes to the actual hard drives for building RAID arrays, your ideal is identical drives. This is both from a capacity and performance perspective, as they are being accessed at the same time and in the same manner. If one is larger than the other, then the additional space will be ignored by the controller. With even the largest hard drives dropping to record lows recently, this still means that TB RAID arrays are now within the scope of the most budget-conscious desktop owner.

BUILD YOUR OWN ARRAY

Ever since low-cost RAID controllers made their way onto motherboard feature lists, their ease of use has improved significantly, to the point where most new controllers boast some form of walkthrough system (or wizard) for setting up the array. And because the controller needs to initialise the logical drives before passing control to the BIOS (so you can boot from your array), any problems are easy to spot, before the machine even boots so you're not going to be asked anything complex about your drives, other than what sort of RAID array you want to build.

If you're looking to build your own array, then it's important to realise that your hard drives will have to be initialised as part of a RAID setup and formatted accordingly — this means that any data on those drives will be lost. You should back up all of your data if you're looking to use one or more of your existing drives, although with the price of drives now so low, it seems churlish not to buy a pair of drives for the task.

> SINCE LOW-COST RAID CONTROLLERS APPEARED ON MOTHERBOARDS, THEIR EASE OF USE IS MUCH IMPROVED

As for configuring the array, you have to attach the drives to the connectors that are handled by the RAID controller — make sure they're visible to that controller (and that the controller is enabled in the BIOS) and then simply define your type of RAID. A striped array may well be called RAID 0, although it depends on the controller used. Once you've selected the drives you want to be treated as a single logical case, hit the 'Build array' button to create it.

The only potentially tricky part is getting your OS of choice onto your newly formed array, as it probably won't have drivers for your RAID controller. This is only tricky if your machine doesn't have a floppy drive. And even if this is the case, you'll only need a floppy drive for the time it takes to install the OS. If you're looking to install Windows Vista, then even this isn't a problem. Apart from the possibility that the drivers are part of the install package, the Vista installer accepts additional drivers on USB keys.

If you're installing Windows XP onto the array, then you need to hit F6 when prompted as part of the installation process. Slide the disk into your floppy drive and it should automatically spot the correct ones for your controller. If you can't find this disk (try your motherboard box, if it's still around), then a visit to your motherboard manufacturer's web site should furnish you with the appropriate utility to create the driver disk for this very task.

Apart from striped arrays being particularly good as your boot drive, such a configuration is useful for operations where you need a lot of hard drive bandwidth, such as when editing videos or large images. This does produce a tricky situation in light of what we've already said about data integrity, though, so it either pays to make backups of your work as you go, or use another form of RAID in addition to your striped array.

Next month, we'll look more closely at redundancy options and the opposite extreme of striping. We'll also look at configuring hot-swappable drives and data integrity. APC

SPOTLIGHT ON... HARDWARE vs SOFTWARE

The RAID controllers that are present on most modern motherboards are for the most part physical interfaces to the drives (and some rudimentary logic for handling transfers and setting up the drives in the first place). Much of the hard work is handled by software, assisted by the OS. This works fine with the tolerances and expectations of desktop users, and due to the power of modern PCs, it's OK for workstations. However, if you're looking for a true high-performance RAID, then a discrete card is the answer. Hardware controllers offer certain advantages over such software implementations, not least of which is speed, as they boast dedicated logic for distributing the data to the drives at speed. Hardware controllers also benefit from onboard memory, which acts as a cache to the hard drives and thus can significantly speed up many operations. Controllers aren't cheap though: expect to pay anything from $400 for a good one.

If you're looking for high-end performance, get a discrete hardware RAID controller.

Linux does Windows

Run Windows games and applications without either a virtual machine or a Windows installation. *Graham Morrison* shows you how.

REQUIREMENTS

- **WINE**
  Install this from your Linux distribution.

You may thinks it's sacrilege to suggest there's a way to run Microsoft Windows software on your Linux desktop, but the sad truth is that there are still many Windows applications and games that simply don't have an open source equivalent. In these cases, it's better to adapt your Linux installation to accommodate these wayward cousins than to throw in the towel and reboot to a native Windows installation. And the best thing is that adapting needn't mean installing proprietary software either, thanks to the immense efforts of the Wine project.

The first thing to get straight is that Wine is not an emulator. Not only is it the basis for the recursive acronym that gives the project its name, it's also an indication of how the developers view their project, and how they want it to be perceived. Wine is a clever piece of engineering that the word 'emulation' doesn't adequately describe. There's no getting away from the idea that Wine lets you install Windows applications that run on your Linux desktop, oblivious to the open nature of their host OS — an idea that could also be used to describe an emulator.

What differentiates Wine from a regular emulator is that the Wine developers have used Microsoft's Windows API to recreate the Windows system libraries in enough detail that many Windows programs run unaided. They're not running against an emulated version of a Microsoft OS, they're running against freely available and open source recreations of the Microsoft libraries. Wine developers have built into their compatibility layer the exact same functionality contained within the Windows libraries, only without the massive resources of the Redmond upstart, and with enough efficiency that you can hardly tell the difference.

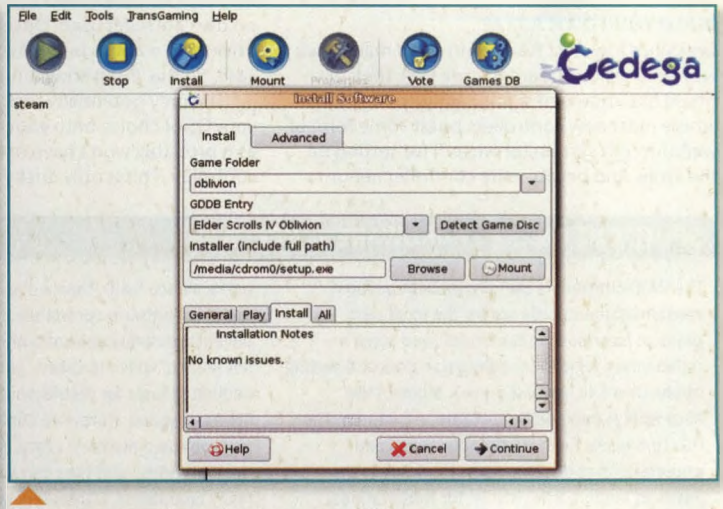
NEW RELEASES

Progress with the DirectX layer has been vast, re-implementing enough of Microsoft's games API that it's possible to play many older Windows games without modification, and that includes hardware acceleration. Newer releases even support World of Warcraft and Eve Online. It's for these reasons that Wine is one of the most important, and at the same time contentious, open source projects of its kind.

There are two broad branches of Wine development. The most popular is a branch called 'CrossOver', developed by a company called CodeWeavers. CodeWeavers employs the lead Wine developer, Alexandre Julliard, and sets its sites on providing Microsoft Office compatibility along with several other high-profile Windows applications like Adobe Photoshop and various browser plug-ins.

CodeWeavers charges for pre-packaged versions of Wine, but, if you need Office or Photoshop compatibility, the US$39.95 outlay for the download version is a good investment. The best thing is that every feature and function built into the commercial version is released as open source patches for the free version of Wine, which are in turn rolled back into other versions of Wine. In essence, you're paying CodeWeavers for the installation user interface (it includes a wizard for

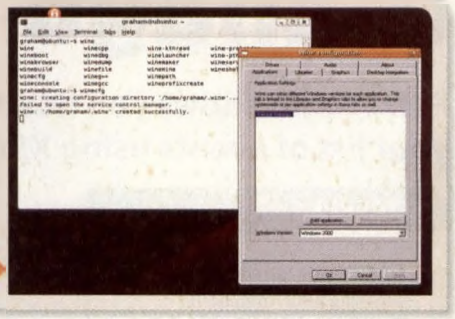
VMWare Workstation lets you run multiple machines at once and supports 64-bit and multicore CPUs.



Cedega is pre-configured to support specific games. If it's not in the list, it's unlikely to work.

DO THIS... CONFIGURE WINE

The easiest way to install Wine is through your distributions package manager. It's also possible to download the Wine binaries directly from the main web site as well as build the application yourself. To launch this, just type 'winecfg' on the command line. The correct directories for your configuration will be created and the user interface will appear. Several tabs are used to manage Wine installed applications. The 'Applications' tab lets you define which version of Windows you want Wine to present to the Windows application you want to run. Currently, the selection covers everything released between Windows Server 2003 and Windows 2.0, but the default option of Windows 2000 is the most compatible. The Windows version is configured on a per-application basis, and you'll need to locate the executable to make the setting stick. Another tab in the configuration panel is 'Graphics'. It's from here you can enable the experimental DirectX support for running games.



Configure Windows applications that use Wine through the included GUI.

the most popular Windows software), the high level of community support, and to make a positive contribution to development. As a result, CrossOver is very similar in operation to the open source version of Wine that you can freely download and install.

CodeWeavers recently released an OS X version for Intel-based Macs to fill a similar gap on the Apple desktop, and this will help to broaden its appeal. In sync with the OS X support, the focus on compatibility has also moved from Office support (which is already working well), to explicitly supporting Windows games — partly because of the dearth of anything decent for either OS X or the Linux desktop. But games support is still at an early stage, and there are only a few hand-picked titles that will work.

WINDOWS GAMING

The other main branch of Wine development is known as 'Cedega', developed by a company called 'TransGaming Technologies'. As the company name suggests, Cedega's target audience are unashamedly gamers, and it's largely successful at bringing a massive library of Windows-only games to the Linux desktop.

This is one of the main reasons why CrossOver has recently shifted focus to support games too — Cedega is its closest competitor, and the latest release is significantly more successful than CrossOver at bringing Windows titles to Linux. It supports top titles like World of Warcraft, Half-Life 2, Oblivion and Battlefield 2. The only downside is that, like the Windows versions, most modern games require some serious graphics hardware with Shader Model 2.0 support and a powerful CPU to match.

And Cedega isn't free either. It uses a subscription-based model, where three months of updates will cost you around US$5. This also gives you the right to vote to ask TransGaming to support your favourite game, with a promise that support for the most popular choices will be rolled into the next release — a free download if you've got an active subscription. If this expires, you can still play all your games — you just won't receive any further updates.

Unlike CodeWeavers though, very little of the extensively modified Wine source code is submitted back to the Wine code repository. Cedega is actually a proprietary product, forked from Wine at a time when the licence allowed independent development like this. There's legitimate reason for the closed aspect of the project — many of the CD/DVD protection schemes employed by Cedega are licensed under very strict redistribution regulation. But TransGaming's strategy is still a common cause of debate and is a restriction for Linux users that like to spend their money on an open source project.

> THE FIRST THING IS THAT WINE IS NOT AN EMULATOR – AN INDICATION OF HOW THE DEVELOPERS VIEW THEIR PROJECT

FREE WINE

Many Linux distributions take a cautious approach to bundling Wine with their download images and DVDs. Wine is seldom installed by default, but there are usually official packages available. With Ubuntu, for example, you need to allow the Universe package repository in Synaptic, before searching for and installing the 'wine' package. After installation, 'wine' will become the default application to be executed when you click on '.exe' files in your file manager.

Installing Windows applications is almost as easy as in Windows itself. Download 'setup.exe' for your chosen Windows application (Microsoft installer files ending with '.msi' should work as well), then either double-click on this to launch the application with Wine, or type 'wine' on the command line if you're feeling brave. Wine will run through the setup procedure, and everything should look just like Windows. By default, this will be more Windows 98 than Windows Vista, but this can be changed with a configuration option. The application will be installed into a hidden '.wine' folder in your home directory, and a link should be added to your menu.

Wine recreates the Windows system directories, as well as 'Program Files' and 'My Documents' in its own hidden folder, and Windows registry settings are confined to a single 'reg' file. All this is controlled by the single large config file in the top hidden folder, and it's from here you can change anything about Wine's behaviour (optical drives to use, how they're mounted, how your network behaves, Windows version to support etc.). Unless you know what you want to change, the default works well.

SPOTLIGHT ON... VIRTUALISATION

Virtual machines are software recreations of the various components you find in a typical PC. The memory controller, motherboard, BIOS, hard drive and graphics hardware all have to be reconstructed by the programmer using lines of code. CPU instructions are passed on to the real CPU in your system without a similar conversion, giving the virtual machine similar performance to your PC. The big advantage for software compatibility is that it has no idea it's running on a virtual machine – you can install either Linux or Windows and both will behave just as they would with a native installation. This is often the best way of getting Windows compatibility on your Linux box, but you will need a separate licence for Windows, and only the premium versions of Vista will allow virtualisation. A good virtualisation product available for Linux is VMWare Workstation (*www.vmware.com*). It's got great support for Windows, and offers extras like multiple snapshots, plug-and-play USB and accelerated video. But it's also expensive. A cheaper alternative is Parallels Workstation (*www.parallels.com*), and version three promises to offer almost all the features of VMWare. There are free alternatives. VirtualBox (*www.virtualbox.org*) is capable of running Windows Vista, and many of the modifications required to make it work have been integrated into the main Linux kernel.

Manage tasks with XML

***Petra Jones* shows you how to revolutionise your list of events using XSLT.**

REQUIREMENTS

- **BASIC WEB EDITING TOOL**
  Anything from Notepad to Dreamweaver, MS Expression Web or Serif WebPlus
- **XML**
  A simple XML list of events to experiment with. You can find this on apcmag.com.

INSIDE INFO

- W3 Schools XSL Tutorial
  www.w3schools.com/xsl
- XSL Transformations (W3 Spec)
  www.w3.org/TR/xslt
- O'Reilly Introduction to XSLT
  www.pcplus.co.uk/url/261/mak13 (?)
- Guide to XSLT Tools
  www.stylusstudio.com/xslt.html
- XML News and Info
  www.xml.com

Lists are everywhere on the internet, from the top 20 music chart and YouTube videos right through to lists of job vacancies and events. But all too often, we're stuck with only one point of view, like a long list of events displayed by date. What if we'd like to see things differently, like those same events but listed by A to Z, or perhaps filter what we see to just one type of event, like 'music festivals'?

EASIER LISTS

Even when we do get our wish, a web site often uses all sorts of complicated scripts to serve up the information we need — or hard codes it into several different HTML pages. The truth is there's a much easier way of giving everyone what they want. In this Workshop, we'll show you how to use XSLT to make a dynamic event diary offering visitors a lot more choice; all you need is a basic web editing tool, or, failing that, our old friend Notepad will do, along with a list of events written in some very simple XML.

There are a number of reasons why writing lists of events in XML is a good idea. Firstly, it's easier to make sense of — if your events info is jumbled up with a lot of formatting HTML, it's harder to read and spot mistakes. Secondly, XML offers more opportunities for querying things like events sorted by date, A to Z or type. Finally, we can even build ourselves a database to store our events and export them to XML, so we can share or re-use the same information for something else.

ADDING THE XML

We've provided a sample list of events on **apcmag.com** called events.xml, for you to get started. You need to copy that into a suitable directory on your computer. That done, open up your web editor and set up a new test site using that directory. In a program such as Dreamweaver, this is found under Files > Manage Sites > New, then select Site to browse for the local root directory. Open events.xml and familiarise yourself with the node structure. The parent element is named <diary> and contains numerous <event> tags, each with children like date, time, name and description. There are also a few namespaces inside the <diary> tag, permitting us to include a bit of HTML (xmlns:html) or a few hyperlink URLs (xmlns:xlink) in here if we want to. Speaking of links, if you're planning to include any link addresses containing additional specific characters like ampersands or dollar signs, make sure you enclose these inside some <![CDATA[...]]> tags. Otherwise, your list of events won't display this properly.

Once you have your events.xml in place, the next step is to add a stylesheet link just underneath the XML declaration at the top of the list of events. We could link to an external CSS file here but we need an XSLT stylesheet powerful enough to run queries, so we'll link to a stylesheet named calendar.xsl instead.

BRINGING STYLE TO EVENTS

Let's make the calendar.xsl stylesheet. The usual declaration, <xsl:stylesheet version="1.0">, should be used, including namespaces for XSL, HTML and XLINK. Add a <xsl:template match="/"> and close off both tags before adding basic HTML head, title and body elements.

Create a simple #container div to hold your page layout with a width and height of 100 per cent, positioned in the top-left corner with overflow set to scroll. For simplicity, define each of your IDs and classes inside the <style> tags in the header of calendar.xsl. Inside the container DIV, create three child containers named #leftborder, #headline and #main.

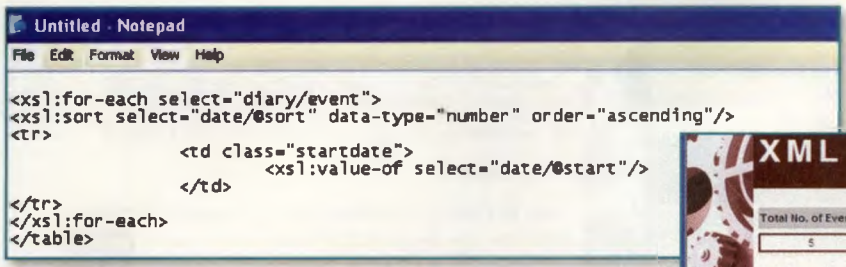
This simple three-part diary design includes a 10-per-cent-wide decorative #leftborder, with a height of 100 per cent, positioned absolutely in the top-left corner with a background image named clockwork3.jpg. Make sure your #headline div is positioned 10 per cent left, 0 per cent from top, with a width of 90 per cent and height of 12 per cent. Use percentages wherever possible to ensure your events diary looks good in a range of browsers and monitor sizes. Finally, add a #main content area positioned 12 per cent from top, and 10 per cent from left with a height of 85 per cent and width of 90 per cent.

EVENTS BY DATE

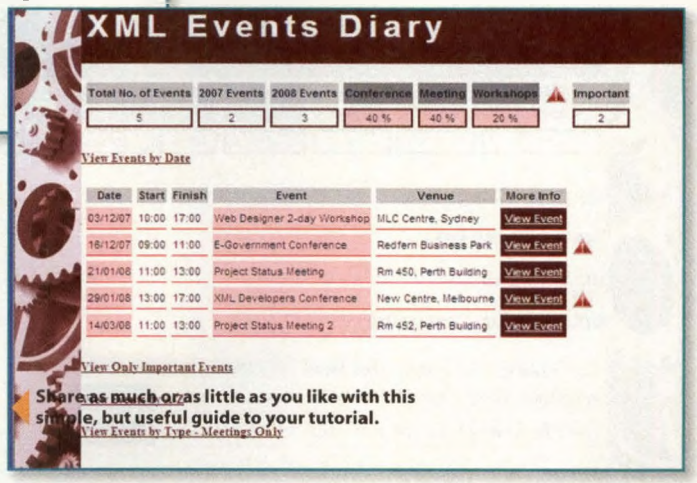
Add another div named #view1 with style set to 'display:block' — this will be the default view of

HANDY TIP

You can use variables to hold conditional count values or other subtotals, and then write XSL statements that add them up, subtract them or even multiply them together.
An example line might be: '<xsl:value-of select="round($meetings + $workshops)"/>'.
Conditional counts bring back numbers of events for 2007: '<xsl: value-of select="count(/diary/event[date/@year='2007'])"/>'.



Sorting your work or social events is done with XSLT. Enter the code to handle the nitty-gritty of it.


XML Events Diary
Total No. of Events
2007 Events
2008 Events
Conference
Meeting
Workshops
Important
5
2
3
40 %
40 %
20 %
2
View Events by Date
Date
Start
Finish
Event
Venue
More Info
03/12/07 10:00 17:00 Web Designer 2-day Workshop MLC Centre, Sydney View Event
18/12/07 09:00 11:00 E-Government Conference Redfern Business Park View Event
21/01/08 11:00 13:00 Project Status Meeting Rm 450, Perth Building View Event
29/01/08 13:00 17:00 XML Developers Conference New Centre, Melbourne View Event
14/03/08 11:00 13:00 Project Status Meeting 2 Rm 452, Perth Building View Event
View Only Important Events
Share as much or as little as you like with this simple, but useful guide to your tutorial.
View Events by Type - Meetings Only

HANDY TIP

Why use XSLT for an Events Diary? Nobody needs to have Microsoft Excel or an Excel reader to view your events diary, making it available online for everyone to use. You can email the hyperlink to anyone who needs to see it, and it's easy to add new events by copying an existing event, then editing the text.

Besides listing events and highlighting important events or particular types of event, you can use variables to count the numbers of each type of event and write XSL statements that add them up, subtract them or even multiply them together. This is good if you need the percentage of events that are meetings, workshops etc.

Share as much or as little as you like with this simple, but useful guide to your tutorial.

> NOTE THAT XSL IS CASE-SENSITIVE – VALUES OF 'yes' OR 'Yes' WOULD NOT RESULT IN THE SAME DISPLAY

events when the page first loads. Inside the tags create a seven-column table named #eventsbydate. After adding the first row of <th> cells, add the code from the screenshot above to sort our events.

This code focuses on the <event> tag under <diary> in events.xml, then displays all the start dates in events.xml on screen sorted by date. The '/@' part of the select statement simply identifies both 'start' and 'sort' as attributes belonging to <date>. Preview events.xml in your browser and you should now see a list of start dates appear.

We can add more fields to our table in the same way to complete it. Type <xsl:value-of select="time/ @start"/> inside another cell to bring back the start times for each event you have listed. Ordinary dates in 20-04-2008 format can be tricky to sort, so a tip is to include an attribute in your XML with dates in YEAR-MONTH-DAY format, eg. '20080420', which can be sorted much more easily. This gives us a table of events with names, start times and date columns all ordered by most recent event.

All our event link info is held within two XML elements named <linkaddress> and <linktitle>. To provide a hyperlink to more information for each and every listed event, add an HTML link tag inside an appropriate table cell. Rather than entering a specific URL, enter the name of the XML element instead inside curly brackets. Then you need to sandwich the link tags around a value-of select statement that will bring back the name for each link.

```
<a href="{linkaddress}" target="_ new"
class="eventlink"><xsl:value-of
select="linktitle"/></a>
```

HIGHLIGHTING IMPORTANT EVENTS

You may want to highlight events in your event diary that are important to you, such as birthdays, particularly if you're intending to use the event calendar to manage your own events. In this instance, we'll write some XSL that marks each important event with an exclamation mark icon.

You should choose a table cell in which you want the important icon to appear. Now enter the following code:

```
<xsl:if test="important= 'YES'">
<img src="exclaim.jpg" border="0"/>
</xsl:if>
```

This XSL looks for an element named <important>. If it contains a value of YES, the exclaim.jpg image is displayed. Note that XSL is case-sensitive — values of 'yes' or 'Yes' would not result in the important icon being displayed.

We can use a combination of JavaScript and CSS to show or hide divs containing alternate views of our events list, such as events by A to Z or date. Save the JavaScript named hide.js (available at **apcmag.com**) to the same folder as events.xml and calendar.xsl. Then add a link to hide.js between the <head> tags of your XSL stylesheet.

Hide.js is a very short javascript containing a function named toggleMe that causes any HTML or XSL between the div tags to be alternately hidden or displayed when the toggling link is clicked. You can add the onClick toggle event to a conventional link, a heading or even a span tag. Edit calendar.xsl and type in the following code:

```
<h5 onclick="return toggleMe('view1')">View
Events by Date</h5>
<div id="view1" style="display: none">
```

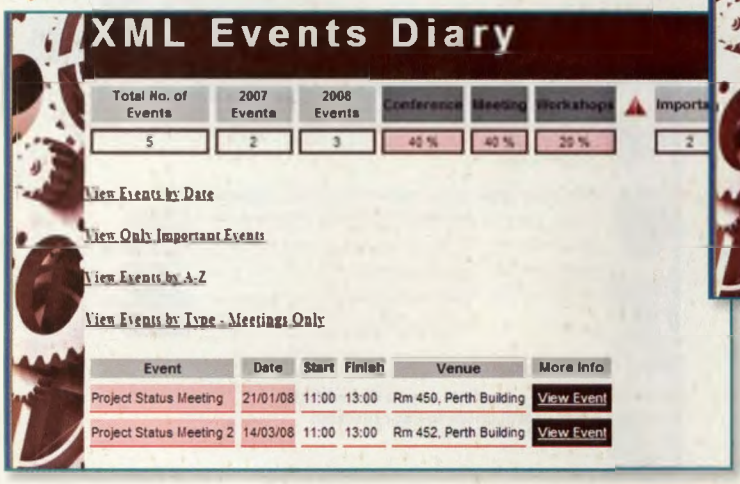
Preview and you should now be able to hide and display your view of Events By Date simply by clicking on this heading, which makes life easier if you want to filter your events to a more accessible format. Create more views by adding extra divs named 'view2, 3, 4' and copy and paste the h5 toggle switch above. But make sure the toggleMe function ties up with the new div name!

EVENTS BY A TO Z

Now, let's create a second view of our list of events, this time sorted by A to Z, that can either be displayed on screen or hidden by clicking on the header. Create a new view as before, using a simple bit of code:

```
<h5 onclick="return toggleMe('view2')">View
Events by ate</h5>
<div id="view2" style="display: none">
```

Events filtered to show meetings only, you can also filter by A to Z or date. Using XSLT will give you the choice of how to filter your events.



View of events ordered by date, this filter will help you keep control of regular events.

Now copy and paste the seven-column table you made earlier, including the XSL code inside the div tags.

Amend your sort select to read as follows: <xsl:sort select="name" />. This will sort our table rows by event name A to Z. You can even swap around the order of the columns in the HTML to put the event name column first.

DISPLAYING SINGLE EVENTS

Filters can be incredibly useful for accessing data — especially if you're the sort of person who has an event list that's in its hundreds — that's like trying to make the needle in a haystack easier to spot.

Let's make a filtered view of our events list that only shows the meetings from our list of events. As before, create a new div but name this 'view3' and make sure the style attribute is set to 'display:none' as shown below. And then add your content after that, using this code:

```
<h5 onclick="return toggleMe('view3')">View Events by Date</h5>
<div id="view3" style="display: none">
</div>
</h5>
```

The next step is to add the XSLT that creates this view of events. The critical part is the 'if' test, which says: 'If the <type> element has a value of meeting, display the event name etc.'

You could replace 'Meeting' with 'Workshop' to provide a view of only the workshop events or you could even change the test to read <xsl:if test="important='YES'"> to make a view that showed only the most important events.

```
<xsl:for-each select="diary/event">
<xsl:if test="type= 'Meeting'">
<tr>
<td class="event">
<xsl:value-of select="name"/> </td>
...
</tr>
</xsl:if>
</xsl:for>
```

And that's the end of the project — your dynamic events diary is complete, offering three different views of events by either date, A to Z, or meetings only.

Try adding some extra views of your own, using the XSLT you've learned in this tutorial. As your events list grows, you might even want to consider writing your own JavaScript that toggles between alternate external stylesheets written in XSL or CSS, but always remember to check your script for cross-browser compatibility.

DO THIS... EVENT PERCENTAGES

Sometimes it's handy and much more time-effective to calculate what percentage of events belong to a particular type — it's a handy way of providing an overview, like '50 per cent of events are team meetings'. In order to calculate the exact total percentage, we'll need to divide the number of events with a type of 'Meeting' by the total number of events and multiply this value by a hundred, all using XSLT.

This might sound tricky, but let's take it step by step. First, you need to create a variable using the syntax below that holds the number of meeting events. Remember to give your variable a logical name that will be easy to remember when calculating your exact numbers.

```
<xsl:variable name="meeting" select="count( / diary/ event[type='Meeting'] )"/>
```

All of your variables should be declared at the top of your XSL stylesheet, just after the stylesheet declaration. Now, create a second variable to calculate the total number of events held in your events.xml file. The variable below will count every <event> node it comes across with this code:

```
<xsl:variable name="total" select="count( / diary/event )" />
```

Now, scroll down your stylesheet and create a sum in XSL to calculate the percentage of events you go to with a type of meeting. We refer to variables using a dollar sign, followed by the name of the variable. This statement says 'divide the $meeting variable by the $total variable, then divide the result by 100 to get the correct number'.

```
<xsl:value-of select="round(($meeting div $total) * 100)"/> %
```

The 'round' part of the statement rounds the percentage down, to avoid us getting a six-digit decimal by default.

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Power Tour Guitar

We've always campaigned for more '60s and '70s rock knowledge amongst the schoolkids of today — which is why we're pleased to see this toy Gibson SG replica, which comes with 'Smoke on the Water' and 'Wild Thing' as pre-programmed jam tracks. There are no strings, just touch-sensitive keys, and 12 inbuilt music tracks, plus lessons you follow on the lightup 'fretboard'.

CONTACT Tiger Electronics
ONLINE www.hasbro.com/tiger/
PRICE $105.95
VERDICT ★★★½☆

BlueAnt Z9 Bluetooth Headset

The models in the BlueAnt catalogue are so incredibly good-looking, they make us want to start wearing headsets as soon as possible. The look is part *Mission Impossible*, part Vidal Sassoon haircare, and the piano-black Bluetooth headsets ooze the statement: 'I'm on the cutting edge'. You get up to 5.5 hours talk time and 200 hours standby battery life.

CONTACT BlueAnt
ONLINE www.blueant.com.au
PRICE $129
VERDICT ★★★½☆

iPod nano

Forget the nano's new video playback, forget the 24-hour battery life when playing music — the big news here is the imminent arrival of Tetris on the nano. Tetris, people! You'll have to get it from the iTunes Store, where you'll also be able to get such classics as Ms. PAC-MAN. Being anti-social just got so much more fun.

CONTACT Apple
ONLINE www.apple.com.au
PRICE $199 (4GB)
VERDICT ★★★½☆

BenQ W10000

The next time your friend boasts about their HD plasma screen, try bringing them round to see the picture quality on this baby. Full 1080p digital at 24fps (unlike other ordinary projectors), this model aims to emulate the cinema experience, with super high contrast, DarkChip3 for detail in dark scenes and Senseye Color Enhancement for better skin tones.

CONTACT BenQ
ONLINE www.benq.com.au/
PRICE $7,999
VERDICT ★★★★☆

apc uBER Super cool apc 1337 Very cool apc n00b Uncool

Logitech G51 Surround Sound Speakers

There should be more tech gadgets that reference *The Matrix*. Now Logitech has heeded the call of Keanu with this surround sound system with 'Matrix' modes. It turns two-channel stereo audio into 5.1 surround, with a gaming mode for extra thump from explosions. You get 155 watts RMS, and the ability to customise the speakers with your own artwork.

CONTACT Logitech
ONLINE www.logitech.com
PRICE $229
VERDICT ★★★½☆

Microsoft Sidewinder Mouse

Stand back noobs, for this is the Excalibur, and the one who wields it must be possessed of macro skills, multi-button dexterity, and the ability to choose several dpi settings... OK, you get the idea. Pulling this out at a LAN party is the equivalent of unsheathing an oversized bowie knife in an outback pub. Pricey, but stacked with features.

CONTACT Microsoft
ONLINE www.microsoft.com.au
PRICE $129.95
VERDICT ★★★★☆

Toshiba Gigabeat U201

Here's something handy: an MP3 player with a built-in FM Transmitter for listening to music via your car audio system. FM transmitters don't give you the best sound, but for short trips around town, this will definitely be up to the job. You get 2GB with this flash player, and you can also rip music directly from CD. No iTunes involved.

CONTACT Toshiba
ONLINE www.gigabeat.com.au
PRICE $199
VERDICT ★★★½☆

Sony Cyber-shot H3

Tiny cameras are great, except when you discover the zoom is terrible. Sony has crammed a 10x zoom — the equivalent of a 38-380mm lens — into this Cyber-shot, and the good news is it isn't a brick. The camera weighs 264 grams and comes with an 'advanced sports shooting' mode, plus face detection. Let's hope this means no more orange skin and red eyes.

CONTACT Sony
ONLINE www.sony.com.au
PRICE $599
VERDICT ★★★★☆

Colin McRae: Dirt

***Troy Coleman* rallies to the cause.**

With its beginnings way back in the last century (first released in the UK for the PC and PlayStation 2 in 1998), the Colin McRae rally series has moved from strength to strength, cementing itself as by far the single best rally driving title on the market. Now eight years later, the sixth and, after his recent tragic death, very possibly final instalment of the game hits the shelves for the PC, XBox 360 and PlayStation 3 platforms.

The incredible power of these next-generation consoles and Direct3D Bloom on the PC help to boost visuals, especially lighting effects, to an extremely high standard, to make the game especially shiny.

Getting in to the game is a snap, but following on from the precedence set in CM05, the menus are over-engineered, making sure that the 'gaming experience' of migraine inducing eyestrain and motion sickness is faithfully maintained.

The game is split into three main single-player sections: Career — a multi-disciplined single race setup where winning earns points and cash to advance through levels and buy new cars; Championship — the classic mode of CMD, race stages of a rally with the quickest time being the objective; and Rally World — a single race/event/time trial mode which is a good stomping ground to hone your skills.

A few new race events have been added in this iteration, Hill Climb — self-explanatory, get to the top of a given hill the fastest; CORR — American-style super-buggy off-road racing; Rally Raid — long off-road events head-to-head with other vehicles; and Rallycross — European-style racing with both on and off-road elements against a field of other racers.

Even though we saw some crazy racing with the Dakar Rally vehicles in CM05, developers seem to be bending to the popularity of other extreme environment racing titles (MotorStorm) by introducing a new and varied range of vehicles, including big rigs and what look like massive armoured campervans. Possibly we are reminiscing over the grand history of the franchise, but getting these things up hills in the dirt, although somewhat entertaining, just doesn't feel right for the brand. It's also during these races that the AI is noticeably rigid and somewhat docile. Snakes of big rigs following a perfect drive line. Trying to pass these guys is a nightmare, especially on windy roads: the only way through being the delicate nudging of bull bars and rending of armoured doors and panels.

Slide off the road and discover that it's all too frustratingly easy to mount various signs, logs and any other obstacles that might be in the way, with no way to get back off them. Restarting the level is the only way to continue playing.

The audio at times throughout felt a little disjointed and — in comparison to CM05 — there was a distinct lack of the awesome spack sounds, as particles of the gravel road surface flew into the undercarriage of the vehicles. The handy co-driver is almost ever present, reciting the difficulty of the oncoming corners and obstacles, but some stages are raced solo, leaving it up to you to figure it out via the small track view at the top of the HUD. It's understandable that there is no musical soundtrack during stages; it just wouldn't feel right if it were there. Let's face it, this isn't Midnight Club, and there will be no pimping of rides. In its place is an incredibly annoying loop playing through all menu selections and load screens.

Multiplayer is also available via System Link or XBOX Live, the latter having the ability to race up to 100 players on a rally or hill climb event.

In the dirt: mixed results on what could be the final in the franchise?

.: AVAILABLE PLATFORMS

PC-DVD | PS 3 | XBOX 360

.: CONTACT Atari

.: ONLINE www.atari.com.au

.: PRICE $109.95 $119.95

✓ More Colin McRae rally action.

✗ AI a little rigid.

.: Xbox 360 VERDICT ★★★½☆

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Alien Syndrome

Peter Dockrill genre-hops in (another) remote space colony.

AVAILABLE PLATFORMS: PC-DVD, Wii, PS3, PSP, XBOX 360, NINTENDO DS

CONTACT THQ
ONLINE www.sega.com
PRICE $89.95

✔ Intuitive, enjoyable control scheme.

✖ Awkward hybrid of action and RPG.

Wii VERDICT ★★☆☆☆

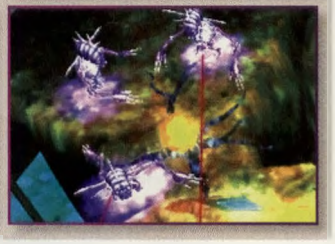
What exactly is it about huge, derelict space hulks, drifting silently through the cosmos, that tends to arouse people's more paranoid suspicions? Perhaps it's the fact that we've been in this territory too many times before — whether in movies, games or comic books — to fail to be aware of the inevitable likelihood of critter contamination in such eerily deserted vessels... and once again we've got such a setup here.

Alien Syndrome is a remake of Sega's top-down arcade shoot 'em up from 1987. The original was an amusing diversion but hardly a true classic of the era, so we were curious to see why this particular property was being rejigged 20 years later for the Wii and PSP and to see what new elements are on the table.

The game sees you take control of Earth Command Trooper Aileen Harding, sent to investigate a mysterious communication breakdown from a remote space station (cue: stunning revelation of alien infestation). As to be expected, it's your job to blast these icky infiltrators to smithereens, and for this purpose you've got the choice of numerous weapons and character classes (demolitions expert, firebug, seal etc.), each with different strengths and weaknesses.

It's this attention to your individual character type and subsequent upgrading that lends Alien Syndrome an RPG-like feel. Unfortunately, the result is a game that's stuck somewhere between two genres: a somewhat uncomfortable hybrid of straight action and more RPG elements. Either way it feels a bit compromised — it's primarily a top-down shooter, but one that gets hobbled by excessive text boxes and bland mini-game mechanics.

More successful is the control system, which has you controlling movement with the Nunchuk and direction with the Remote (while tilting both simultaneously to rotate the camera's perspective). While the gameplay feels a bit old hat, this control scheme is intuitive and accessible, and this (together with multiplayer support) provides the most compelling invitation to take on an otherwise unremarkable challenge.



Two Worlds

Richard Cobbett gets caught in the middle.

AVAILABLE PLATFORMS: PC-DVD, XBOX 360

CONTACT South Peak
ONLINE www.southpeakgames.com
PRICE $85

✔ Fun combat; detailed world.

✖ Annoying character and dialogue.

PC VERDICT ★★☆☆☆

About five minutes into this game, the main character had us all wanting to get nasty. And not in a nice way. Think full-on angry rage. If you've ever bemoaned the traditional RPG 'strong, silent-type', play Two Worlds. The cod-Renaissance Fayre dialogue and constant tidbits of information like 'It's wet' (after swimming halfway through a lake) will sort you out long before you save the world.

Assuming you can put up with that, Two Worlds isn't too bad. It's nowhere near as good as Oblivion, or as ambitious as Gothic, but in terms of style, it fits reasonably well between the two. It's possible to blitz through fairly quickly, due to the lack of permanent death, but there's a strong character build system, some decent quests, and a beautiful (if very generic-fantasy) world to explore. Getting around this world isn't particularly easy – you're meant to use horses, but in practice it's less frustrating to simply walk — but there's plenty of good sight-seeing material in its forests, caverns, deserts, and the themed cities scattered around the world.

Combat is the strongest part of the experience, at least, once you've acquired some fancy moves and routines. It's very arcade-style, as opposed to Oblivion's 'repeatedly-club-over-head' melee.

The only downside of this is the game wants you to explore as you will and make interesting moral choices about how to solve quests... but in practice, you quickly find that almost any problem can be solved quite handily by beating-up everything in sight, with the bonus that you don't have to listen to any more of the awful, awful script, or its equally agonising main character.

If you were to put Two Worlds up against Oblivion, there would be no real contest. However, it's been a long time since that game was released, and we've still to see a genuine successor to its crown. Two Worlds isn't a strong contender, but, it fills in the gap in the meantime.

Eric was enjoying his shiny, new wave-in-the-air drumsticks ever so.

chip chat

by Peter Dockrill

Fan fiction 2.0!

Old-school gamers longing nostalgically for the expansive space exploration and free-roaming adventuring offered by the gaming classic Elite may finally have some new frontiers to boldly go about: Galaxiki (*www.galaxiki.org*) is a "fictional online galaxy created, maintained and owned by its community". Like wikis, anyone can freely edit Galaxiki, and, while membership doesn't cost anything, owning your own "personal solar system" will set you back about US$12 (a steal, when you think about it). In addition to populating Galaxiki with your own stars, planets and moons, you can come up with stories about your solar system and its inhabitants, drop in on your neighbours and their celestial bodies, and take in the bigger picture with the "galaxy browser". So, what are you waiting for? Thank your lucky stars for cosmic collaboration and head on over to Galaxiki. After all, it's already been listed as ".org web site of the week" by *Linux Journal*.

A THOUSAND WORDS

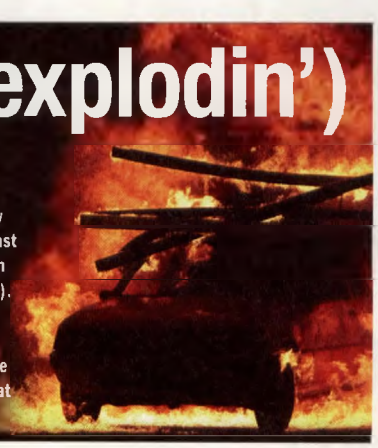
Putting your best foot forward: it means stepping up to the plate, giving your all and showing the world what you're really capable of. In light of this, it's kind of a stumble, if not a complete collapse, to be promoting your company's flash new 70in LCD screen all-in-one PC with an official product shot that clearly shows a Windows XP error message on the display. It's not like this is a random press snap either. To restate: this is the actual promo shot. Not exactly sending a strong message to consumers about your brand's attention to detail, is it? I mean sure, it might dwarf the inert 32in unit in comparison, but size clearly isn't everything. Still, it could have been the BSOD. . . so congrats, guys! Another successful marketing campaign!

Field of dreams

We like our bizarre aerial photography phenomena stories here at Chip Chat, and here's the latest in the series: German programmer Bernd Hopfengärtner envisioned, plotted and mowed this Semacode tag into a wheat field near the town of Ilmenau, Thuringia. The code pattern is 'machine readable' (like a bar code) and translates as "Hello world". (On a smaller scale, implementing code to display messages like this on a device is a common training tutorial for learner programmers.) Described as a "visual code for Google Earth" and measuring in at 160 x 160m, Ben's quirky project may just constitute the largest (and most uplifting and geeky communication) ever displayed from terra firma. And it could be a great advertisement for Victa, too. You can find out more about the project and check out some amazing photos at **http://hello.w0r1d.net**.

Gone fishin' (and explodin')

There's a time and a place for everything, unless the 'time' is right after a 'dangerous exploding laptop battery' recall, the 'place' is a truck full of ammo, and the 'thing' is putting a Dell laptop with such a battery into the truck with the ammo. I think you know where this is heading. As reported by ConsumerAffairs.com, two fisherman in Nevada last year were lucky to escape their exploding Ford pickup, after boxes of ammunition within it caught fire (a Dell Inspiron laptop in the front is believed to have been the firestarter). The pair were packing up when, after hearing popping noises, they smelt smoke and noticed that flames were shooting out of the passenger-side window. The ammo (in the glove box) was promptly set off, which in turn ignited the truck's gas tank. The two were lucky to receive only minor injuries – although the vintage pickup was totalled – in what Consumerist.com described as "the best Dell explosion yet." apc



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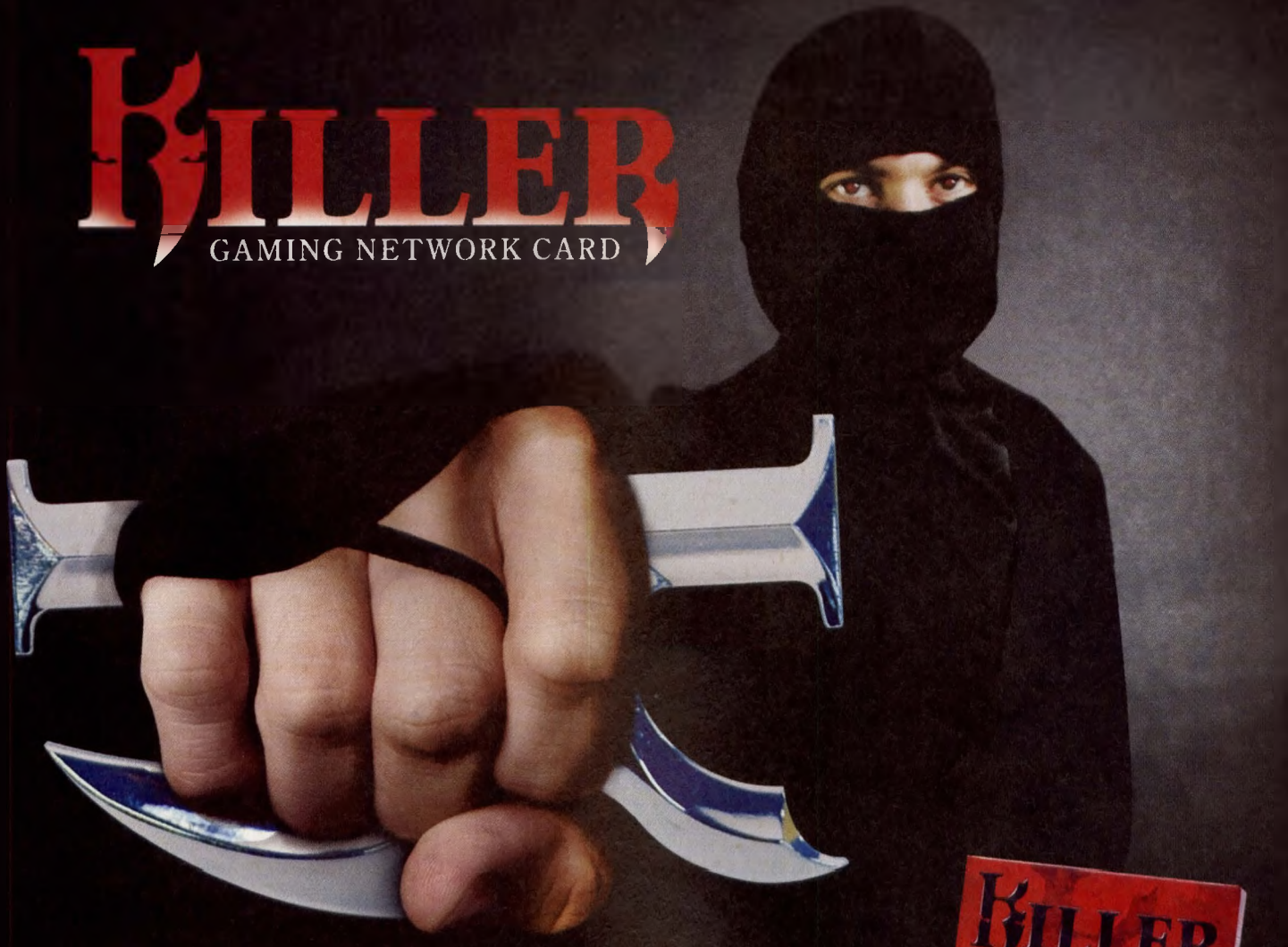

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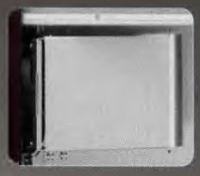

Air Flow Duct for 12cm rear fan

Rear sound proof cover for 8cm top rear fan to redirect hot exhaust air from the PSU away from the case and dampen fan noise.

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PC-S80 awards:

PC Powerplay Magazine, Sept 2006

Atomic Magazine, July 2006

www.virtual-hideout.net

www.amdreview.com

www.boxgods.com

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Windows AD Service Support and NFS File Sharing

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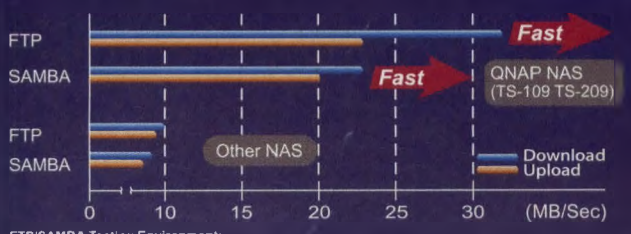
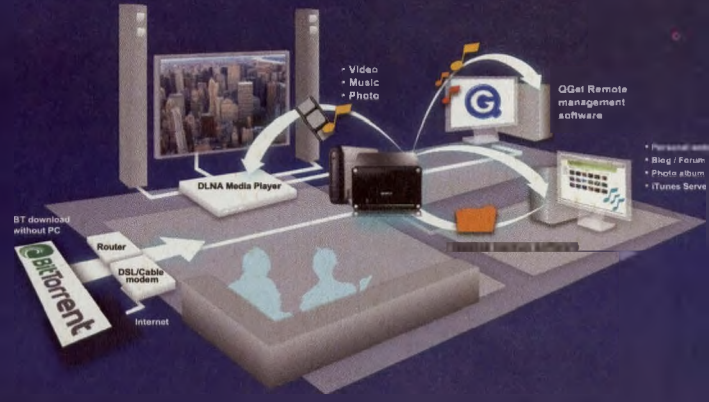


FTP/SAMBA Testing Environment:
Intel® Core™2 Duo E6600 2.4G/ 1G RAM, Windows Vista Ultimate, ZyXEL Gigabit Switch
FTP/SAMBA Testing Method:
Connect TS-109 and PC to switch, upload/download 1GB File without Jumbo Frame, FTP Tool: FileZilla

Play Station 3 & XBox360 DLNA



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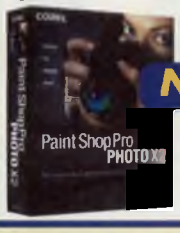

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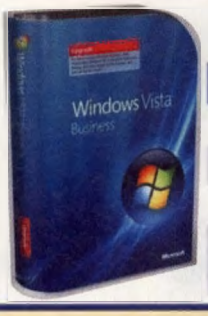

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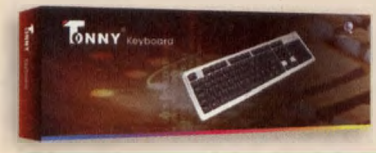

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*Of equal value or less

Premium Photo Quality Paper
- 110gsm
- 100 sheets

A4 (210x297mm)...$11.50 TPP3811

Glossy Photo Paper
- 187gsm
- 20 sheets

A6 (105 x 148mm)...$ 4.90 TPP1846
A4 (210 x 297mm)...$12.90 TPP1811

Premium Glossy Paper
- 256gsm
- 20 sheets

A6 (105 x 148mm)...$ 6.90 TPP2846
A4 (210 x 297mm)...$16.90 TPP2811

Canon Ink Cartridges

TOP BUY PC USER JUNE 2005
Rated 9 out of 10 by PC User

Model	TONNY
BCI-24BK	$5.60
BCI-24C	$7.20

Model	TONNY
BX-3	$28.00
BC-02	$28.00
BC-03	$28.00
BC-05	$30.00
BC-20	$28.00
BCI-3eBK	$8.80

Model	TONNY
BCI-3eC/M/Y	$6.40
BCI-6BK	$6.40
BCI-6C/M/Y	$6.40
BCI-6G	$6.40
BCI-6R	$6.40
BCI-6PC/PM	$6.40

Model	TONNY
BCI-15BK	$6.40
BCI-15C	$7.20
BCI-16C	$7.20
BCI-21BK	$4.90
BCI-21C	$6.40

NEW! Canon Models

Model	Genuine	TONNY
PGI-5BK	$22.50	$8.50
CLI-8BK	$22.50	$8.50
CLI-8C/M/Y	$22.50	$8.50
CLI-8PC	$22.50	$8.50
CLI-8PM	$22.50	$8.50

Samsung Ink Cartridges

Model	TONNY
M40	$23.00

Epson Ink Cartridges

Model	TONNY
T001	$18.90
T003	$ 9.90
T005	$18.00
T007	$ 9.30
T008	$13.00
T009	$15.00
T013	$ 4.50
T014	$ 7.90
T017	$ 9.70
T018	$10.60
T026	$ 9.70
T027	$12.40
T028	$ 9.70
T029	$10.60
T038	$ 9.60

Model	TONNY
T039	$10.60
T0321	$10.80
T0322	$ 7.50
T0323	$ 7.50
T0324	$ 7.50
T0422C/M/Y	$ 9.50
T0461	$ 8.90
T0472/3/4	$ 8.90
T0491/2/3	$ 8.90
T0494/5/6	$ 8.90
T0540/1/2	$ 8.90
T0541/2/3/4	$ 8.90
T0547/8/9	$ 8.90
T0561/2/3/4	$ 8.90
T5591/2/3	$ 8.90

Model	TONNY
T5594/5/6	$8.90
T0621	$8.90
T0631/2/3/4	$7.50
T0731/2/3/4	$9.50
T0811/2/3	$9.50
T0814/5/6	$9.50
S020089	$9.90
S020093	$5.10
S020097	$9.00
S020108	$6.50
S020110	$9.50
S020187	$5.10
S020189	$6.50
S020191	$9.00
S020193	$9.50

HP Ink Cartridges

Model		TONNY
51625A	(#25)	$28.00
51626A	(#26)	$28.00
51629A	(#29)	$28.00
51633MA	(#33)	$32.00
51645A	(#45)	$16.00
51649A	(#49)	$28.00
C1823D	(#23)	$30.00
C4841/2/3/4AA	(#10)	$14.00
C4836/7/8A	(#11)	$14.00
C5010DA	(#14)	$26.00
C5011DA	(#14)	$24.00
C6578D	(#78)	$30.00
C6614A	(#20)	$24.00
C6615DA	(#15)	$24.00

Model		TONNY
C6625A	(#17)	$30.00
C6656AA	(#56)	$18.00
C6657AA	(#57)	$32.00
C6658AA	(#58)	$26.00
C8727A	(#27)	$24.00
C8728AA	(#28)	$26.00
C8765WA	(#94)	$27.00
C8767WA	(#96)	$29.00
C9363WA	(#97)	$32.00
C8721WA	(#02)	$11.00
C8771/2/3WA	(#02)	$10.00
C8774/5WA	(#02)	$10.00
C9351AA	(#21)	$21.00
C9352AA	(#22)	$23.00

Brother Ink Cartridges

Model	TONNY
LC-21BK	$7.90
LC-21C/M/Y	$7.50
LC-02BK	$7.90
LC-02C/M/Y	$7.50
LC-04BK	$7.90
LC-04C/M/Y	$7.50
LC-47BK	$7.90
LC-47C/M/Y	$7.50
LC-57BK	$6.90
LC-57C/M/Y	$6.50
LC-800BK	$7.90
LC-800C/M/Y	$7.50

Lexmark Ink Cartridges

Model	TONNY
12A1970	$32.00
12A1980	$35.00
17G0050	$32.00
17G0060	$35.00
13400HC	$36.00
13619HC	$38.00

Model	TONNY
10N0016 (#16)	$36.00
10N0026 (#26)	$39.00
15M0120 (#20)	$41.00
18C0031 (#31)	$35.00
18C0034 (#34)	$35.00
18C0035 (#35)	$37.00

Model	TONNY
18L0032 (#82)	$39.00
18L0042 (#83)	$41.00

Brother Toner Cartridges

Model	TONNY
TN-100	$23.00
TN-200	$23.00
TN-2025	$59.00
TN-300	$23.00

Model	TONNY
TN-3060	$65.00
TN-8000	$23.00
TN-6600	$65.00
TN-7600	$65.00

Epson Toner Cartridges

Model	TONNY
EPL-5700	$49.00
EPL-5900	$49.00
EPL-6200	$49.00

Lexmark Toner Cartridges

Model	TONNY
Optra E210	$59.00
Optra E310	$69.00
Optra E/E+	$59.00
X215	$59.00

HP Black Toner Cartridges

Model	TONNY
92298A	$ 65.00
C3906A/F	$ 49.00
C3903A	$ 59.00
C3909A	$ 95.00
C4092A	$ 49.00
C4096A	$ 65.00
C4127A	$ 65.00
C4127X	$ 80.00
C4129X	$ 95.00
C4182X	$135.00
C7115A	$ 49.00
C7115X	$ 65.00

Model	TONNY
C8061X	$ 85.00
Q1338A	$ 95.00
Q2612A	$ 59.00
Q2613A	$ 59.00
Q2613X	$ 69.00
Q2610A	$ 75.00
Q2624A	$ 59.00
Q5942A	$ 95.00
Q5942X	$125.00
Q5949A	$ 59.00
Q5949X	$ 75.00
Q6511A	$105.00

TONNY Colour Toner Cartridges

Printer Model	Model	TONNY
HP LJ1500/2500, Canon LBP2410	C9700A (BK)	$65.00
	C9701/2/3A (CYM)	$79.00
HP LJ4600	C9720A (BK)	$155.00
	C9721/2/3A (CYM)	$185.00
HP LJ4500, Canon LBP2460/2040	C4191A (BK)	$59.00
	C4192/3/4A (CMY)	$69.00
HP LJ8000	C4149A (BK)	$89.00
	C4150/1/2A (CMY)	$155.00
Epson C900/1900	S050100 (BK)	$79.00
	S050097/98/99 (CMY)	$119.00
Epson C1000/C2000	S050033 (BK)	$90.00
	S050034/5/6(CMY)	$119.00

Samsung Toner

Model	TONNY
ML-1210D3	$ 59.00
ML 1650D8	$105.00
ML-1710D3	$ 59.00
ML-2010	$ 59.00
ML-2150D8	$140.00
ML-4100D3	$ 83.00
ML-4500D3	$ 73.00
ML-6060D6	$ 93.00
SCX-4216D3	$ 59.00
SCX-5312D6	$ 79.00
SCX-D4200A	$ 69.00
SF-5100D3	$ 59.00

Canon Toner

Model	TONNY
E-31	$85.00
EP-22	$49.00
EP-25	$49.00
EP-26	$69.00
EP-32	$65.00
EP-52	$80.00
FX-3	$59.00
CART-303	$59.00
CART-N	$76.00
CART-U	$69.00
CART-W	$55.00

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Standard Notebook Carry Bag

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- Includes Backspace and 000 Key

$15.00

Rechargeable Wireless Optical Mouse

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Novel Clip Lamp with LED Light

- AG13 x 3 Battery Included

$3.30

USB 2.0 Dual PC Gamepad

$25.00

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Toner powder also available for HP & Samsung from $14.95

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TELEPHONE LINE SOLUTIONS

Save Money, Improve Efficiency Or Add A Professional Touch To Your Line

TELEPHONE CALL RECORDING FOR ANY APPLICATION

LINE CONNECT model

CRU2 is designed to connect direct to ANY telephone extension, to provide High Quality telephone call recording to your PC (PC software provided) or other recording device. Provides automatic operation with start/stop capability from any telephone.

HANDSET CONNECT model

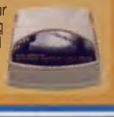
CRU3 is designed to connect to any PABX, COMMANDER, PSTN or VOIP handset. Will then provide High Quality telephone call recording to your PC (PC software provided). Automatic operation with start/stop activation from your PC.

PROFESSIONAL model

CRU4 provides all facilities of the CRU2 Model (it connects to any handset) and in addition allows message(s), or previous recordings to be played back to the other party at any time. Allows notes to be tagged to the recording file.

AUTO DIGITAL ANNOUNCEMENT

Our AUTOMATIC ANNOUNCEMENT DEVICE will Answer your incoming telephone calls, play an announcement and then resume ringing of your telephones. Ideal for announcing change of number or that the call will be recorded.



TELEPHONE LINE DOOR STATION SOLUTIONS

DOOR STATION UNIT

DS2 will RING all of your telephones when a visitor arrives at your front door or gate. Answer to communicate. Open the door or gate with touch tones. Operates on any ordinary single line or multi-line phone system. Requires surface mount or flush mount door phone.

PABX DOOR STATION UNIT

DS4 is designed to be connected to an analogue extension of any PABX, Commander or other multi line telephone system. DS4 goes "off hook" when activated by the door phone. Requires surface mount or flush mount door phone.

DOOR STATION DIAL OUT

Our New DS6 model will RING your telephones and then DIAL OUT to a pre-programmed telephone number if a visitor arrives and you are not home. Requires Surface Mount or Flush Mount Door Phone. Can also connect to a PABX extension.

DOOR PHONES

A range of door phones are available

SHARE YOUR LINES AND SAVE INSTALLATION & RENTAL CHARGES

FAXSTREAM DUET SWITCHES

Will allow any Fax or Modem device to operate with the Telstra FaxStream Duet service. Provides fully automatic fax reception, just like having a separate line. Two models are available.

INTELLIGENT FAXSWITCH

FAX SWITCH will allow your existing Fax Device to connect to any Single Telephone line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Fax operation. Will operate with all existing telephones and also an Answering machine.

INTELLIGENT MODEMSWITCH

MODEM SWITCH allows your existing Data Modem Device to connect to any Single Telephone Line, Fax Line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Dial In & Dial Out Modem Data operation. Models available that allow up to 8 devices on 1 line.

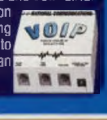
EFTPOS SWITCH

EFTPOS switch will allow your existing EFTPOS device to share any existing Single Telephone Line, Fax Line or a Multi Line (PABX) phone system. Provides automatic connection on dialing. BARGE-IN protection prevents interference when line is in use. Alternative model will allow operation on 2 lines.

MISCELLANEOUS TELEPHONE LINE APPLICATIONS

VOIP SELECTOR

This device will allow you to connect one or more telephones to your TELEPHONE LINE and VOIP LINE. Incoming calls from either line ring on the connected telephone(s). Outgoing calls are automatically DEFAULTED to ONE LINE, but the alternative line can be selected by DTMF code.



TWO LINE SELECTOR

Premium device will allow you to connect one Telephone Device to two Telephone lines (Telstra, Optus, VOIP, PABX etc). Ideal for EFTPOS, Cordless Phones, Modems etc. Additional features are provided, including automatic (or manual) selection of an alternative line if the default line is busy.

TELEPHONE CALL TRANSFER

Easy-Transfer will allow you to answer a call on one telephone and then TRANSFER the call to another telephone fitted to the same li... Also provides INTERCOM facility. Us... your existing telephones.

MULTIPLE NUMBER SWITCH

Operate Two numbers on one line. This device will connect your Multiple number calls to one set of phones or answering machine and your Normal number calls to another set of phones or answering machine.

TELEPHONE LINE ON HOLD SOLUTIONS

DIGITAL ON HOLD

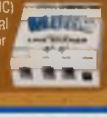
DMS, Australia's Leading On Hold player, is an MP3 based Message On Hold Device designed to provide the High Quality and High Reliability that is necessary for all telephone On Hold applications. Easy message change provided by replacing memory card.

ELECTRONIC MESSAGE UPDATE

DMC is available with range of optional Automatic electronic message update methods including Email, Modem, FTP and Network IP. We have a National Network of Dealers ready to produce your customized message.

SINGLE LINE ON HOLD

Just plug our MOH Line Sharer into any socket on your single telephone line, connect any audio source (Radio, PC or DMC) and you now have a professional telephone line On Hold facility for your existing telephones.



AUTOMATIC CALL ATTENDANT

Our single line CALL ATTENDANT will answer your incoming calls after 4, 6 or 8 rings, play a greeting & then put your call on hold until you are able to answer. Also provides Message on Hold facility for your single line.

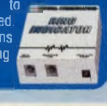
MORE MISCELLANEOUS EQUIPMENT

TELEPHONE LINE SIMULATOR

This TELEPHONE LINE SIMULATOR can be used for testing, programming & demonstration of analogue telecommunications equipment, without the need to use a telephone line and generating costly calls. 4 Models are available.

RING INDICATOR

This device detects incoming calls and will close/open a relay to match the cadence of the incoming ring. Can also be set to close a relay until a call is answered. Ideal for control of external horns or lights to advise of an incoming telephone call.



REMOTE TELEPHONE ACTIVATOR

Call in to Switch ON, Switch OFF or RESET your PC, SERVER or any electrical equipment by telephone line using touch tone commands. RTA connects to any telephone line. Requires PCU accessory. 3 models are available.

POWER CONTROL UNIT

PCU connects direct to the RTA and also to your power socket to allow telephone line dial in switching of the 240V supply connected to your equipment. Easy Plug In User Installation. Controls up to 10 Amps.

DIGITAL AUDIO EQUIPMENT

MESSAGE ON DEMAND

TDS can be programmed with up to 256 MP3 based messages stored on an MMC/SD card, which can be recalled and played by keypad entry or time programmed sequences.

BACKGROUND MUSIC SYSTEM

High Quality BMS holds up to 4GB of MP3 Music/Messages on a SD Flash Card. Plays Messages at user set intervals. Powerful internal amp will allow direct connection of up to 8 speakers. Line level output is also provided. Has encryption facility.

TALKING DISPLAY UNIT

TDU will play 1 or more pre-recorded messages as soon it is triggered by a movement sensor, a switch, or at a preset time interval. Ideal for Product Promotions, Product Information, Message Warnings etc.

MULTIPLE INPUT UNIT

MIU will allow for up to 12 separate movement sensors or switches to be connected to the TDU. Each sensor triggers its own unique message, output via any 8 ohm unpowered, powered or amplified speaker.

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2 IP Addresses
99.9% Network SLA
5GB Included Data

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$99 setup

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Global Switch Data Centre
1 x 24 / 7 Access Card Included
15AMP Max Power
32 Remote Reboot Power Ports
32 IP Addresses
99.9% Network SLA
50GB Included Data

$1,100 per month
$600 setup

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16 Remote Reboot Power Ports
16 IP Adresses
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25Gb Included Data

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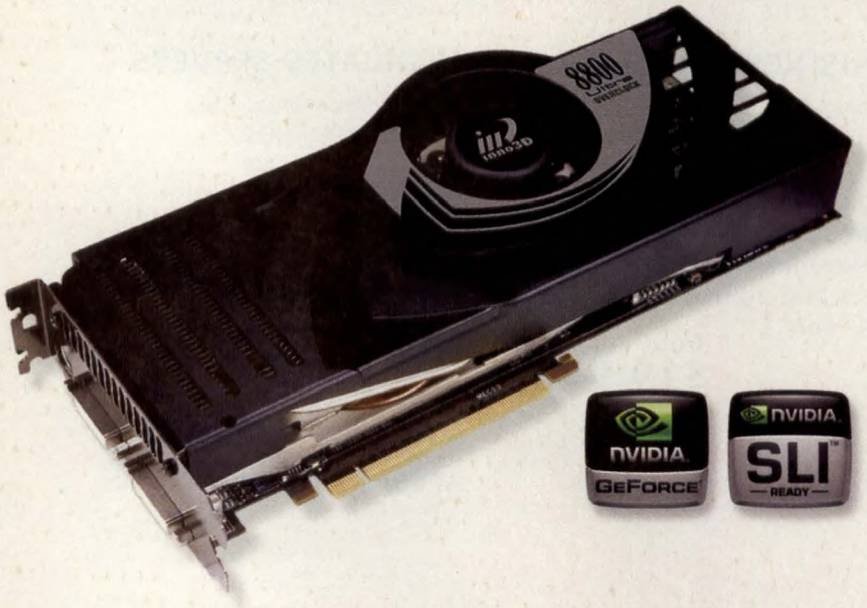
Get your PC rockin'
with Factory Overclockin'



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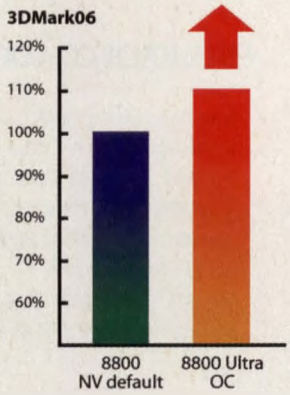
8800Ultra OC

Inno3D 8800 GTX	Standard	Overclocked
Memory	768MB DDR3	768MB DDR3
Core Frequency	612MHz	**640MHz**
Memory Frequency	2160MHz	**2280MHz**
RAMDAC	400MHz	400MHz
Interface	PCI-Express	PCI-Express
Memory Bus	384-bit	384-bit



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SA	Allneeds Computers	08 8211 8661	www.allneeds.com.au	Do It Yourself I.T. Supply	08 8340 8090	www.diyit.com.au
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Cat 11683

Cat. No.	Description	Price
11683-1	USB Extender to 60m over LAN cable	$99
3627-1	DVI Extender to 15m over LAN Cable	$169
3628-1	DVI Extender to 45m over LAN Cable	$269
3441-1	VGA Extender to 130m over LAN Cable	$399
11625-1	Console Extender to 80m over Standard Cables	$179
11662-1	Console Extender to 150m over LAN Cable	$399
11812-1	Wireless TV/Video Sharer to 100m (2.4Ghz)	$79

Cat 3441

USB Converters

Cat 2685

Cat 2929

Cat 23025

Cat. No.	Description	Price
2729-1	USB to Parallel – DB25	$59
2685-1	USB to Parallel - Centronics	$35
2920-1	USB to Serial (RS232) 1 Port	$59
2929-1	USB to Serial (RS232) 8 Port	$459
2853-1	USB to RS422/485 1 Port	$249
2907-1	USB to RS422/485 4 Port	$560
23025-1	USB to 5.1 Sound Adapter	$45

PC Switches

Cat 11667

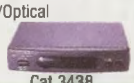
Cat 11668

Cat 11657

Cat. No.	Description	Price
11667-1	Console Share Switch – 2 Users share 1 PC	$139
11668-1	KVM Switch 2 Port with Cables – PS/2	$75
11658-1	KVM Switch 2 Port with Cables & Audio - USB	$85
11670-1	KVM Switch 4 Port with Cables & Audio – PS/2	$110
11659-1	KVM Switch 4 Port with Cables & Audio - USB	$135
11657-1	KVM Switch 16 Port – PS/2	$799
12049-1	USB Manual Switch – 4 Port	$39

AV Switches

Cat 23032


Cat 3438

Cat. No.	Description	Price
23055-1	HDMI 2 Port Switch with Remote Control	$115
23054-1	HDMI 4 Port Switch with Remote Control	$169
23003-1	AV Switch 3 Port with S-VHS/RCA & RCA/Optical	$89
23032-1	AV HD Switch 3 Port with Component & RCA/Optical	$99
23002-1	Optical Audio Switch – 4 inputs & 2 outputs	$118
23003-1	Optical Audio Switch – 3 inputs & 1 output	$89
3438-1	AV Switch RCA – 4 inputs & 2 outputs	$89

What's New?

Cat. No.	Description	Price
9287-1	Cordless Pen Mouse	$129
9521-1	Cordless Pen Mouse with Laser Pointer	$149
9526-1	**Remote Control - Voice Activated & Programmable!**	**$389**
1008265-1	Wireless VGA Adapter (802.11g based)	$549
17115-1	**LGA775 Motherboard with ISA Slots**	**$649**
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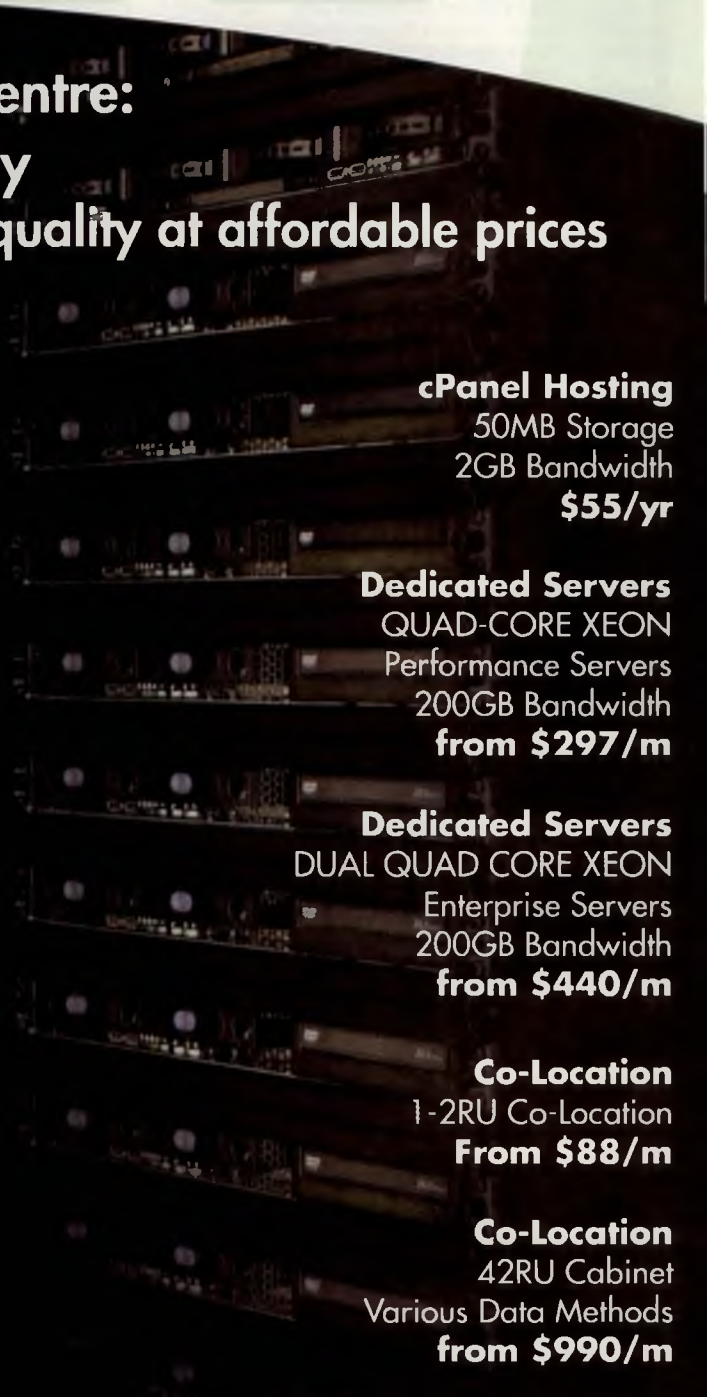

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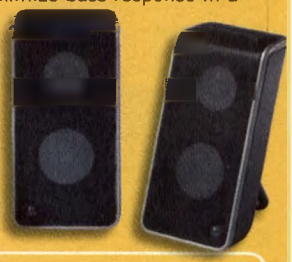

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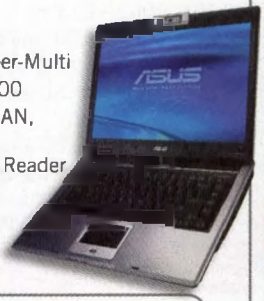

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Lenovo R61E Notebook

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- Intel Graphics Chipset
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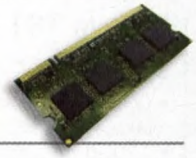

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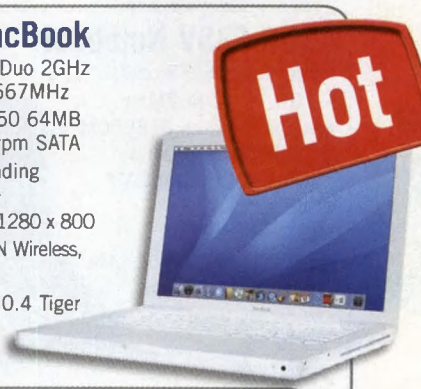

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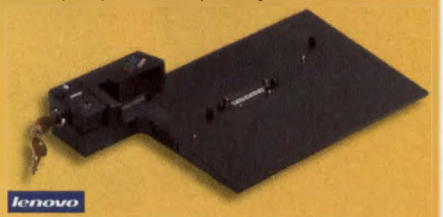

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Disc not included

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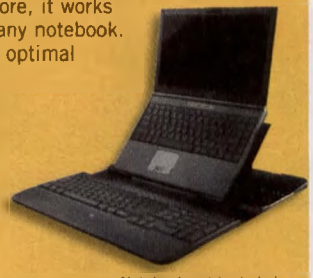

Notebook not included

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Lenovo ThinkPad R61 Notebook

Part Number	8918I1M
Processor	Intel Core Duo Processor T7500 2.2GHz
Memory RAM	2GB DDR2 667MHz
Video Card	NVIDIA NB8M-GS 128MB Graphics
Hard Drive	120GB 5400rpm SATA
Optical Storage	DVD Burner
Display	15.4" WSXGA 1280 x 800
Connectivity	56K Modem, Gigabit LAN, 802.11a/b/g Wireless
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- Genuine Windows XP Pro

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BONUS: Free Mini Optical Mouse & Carry Bag

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- nVidia GeForce Go8600M GS 256MB Graphics
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- DVD-Super Multi
- 15.4" WSXGA
- 56K Modem, Gigabit LAN, Wireless, Bluetooth
- Windows Vista Ultimate

$2288 | SAVE $111 off RRP | WebCode: ASU0768

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- 1GB DDR2 667MHz
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- DVD Burner Display
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- NIC, Intel 802.11n, Bluetooth, Fingerprint Reader
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Suit of Armor

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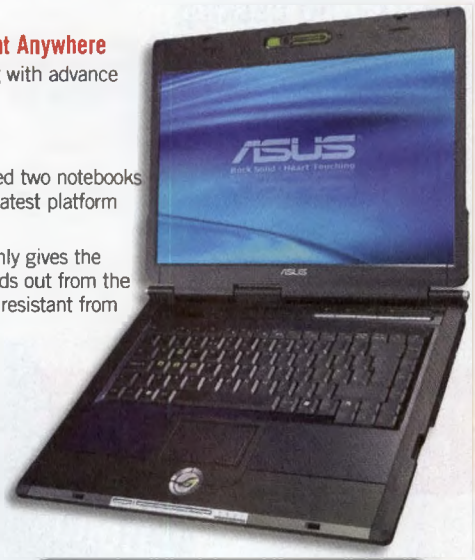

- Intel Core Duo Processor T7500 2.2GHz
- 2GB DDR2 667MHz
- nVidia GeForce Go8600M GT 256MB Graphics
- 200GB 4200rpm SATA
- DVD Burner
- 15.4" WSXGA+
- 56K Modem, Gigabit LAN, 802.11a/b/g/n Wireless
- Genuine Windows Vista Ultimate

ASUS

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HP 6710B Notebook

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- 2GB DDR2 667Mhz
- Intel GMA X3100 up to 384MB shared Graphics
- 160GB 5400rpm SATA
- DVD Burner
- 15.4 WSXGA+ 1680 x 1050
- 56K Modem, Gigabit LAN, 802.11a/b/g/n Wireless
- Genuine Windows Vista Business

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Acer TravelMate 7720G

acer

- Intel Core 2 Duo T7500 2.2GHz
- 2 GB DDR2 667MHz
- ATI Radeon HD 2600 XT 512MB Graphics
- 2 x 160GB 5400rpm SATA
- DVD-Super Multi Dual Layer
- 17" WSXGA 1440x900
- 56K Modem, Gigabit LAN, Wireless N, Bluetooth
- Genuine Windows Vista Business

$2236 SAVE $263 off RRP
WebCode: ACE0066

Lenovo X61 Notebook

- Intel Core 2 Duo T7250 2Ghz
- 1GB DDR2 677Mhz
- Intel X3100 128MB Graphics
- 120 GB 5400rpm SATA
- 12.1" XGA 1024 x 768
- 56K Modem, Gigabit LAN, Wireless N, Bluetooth
- Genuine Windows Vista Business

Weight 1.63kg

FREE: THINKPAD Premiere Leather Case and 4GB Security Memory Key

*See www.csw.com.au/promotions for terms and conditions. Offer ends 30/11/2007

$2872 SAVE $87 off RRP
WebCode: LEN0038

MacBook Pro

Authorised Reseller

- Intel Core 2 Duo 2.4GHz
- 2GB DDR2 667MHz
- NVIDIA GeForce 8600M GT 256MB Graphics
- 160GB 5400rpm SATA
- SuperDrive 8X
- 15.4" TFT 1440 x 900
- Gigabit LAN, 802.11a/b/g/n Wireless
- Mac OS X v10.4 Tiger

$3476 SAVE $123 off RRP
WebCode: APP0303

Cellnet Golla Laptop Bags

Suitable for laptops with 15inch screens and will also hold all stationary including mobile phone holder

- Double stitching and heavy padding to keep your laptop safe
- Designed for everyday use, ultra light structure
- Golla Laptop Bag (style dance) is Off White colour
- Golla Laptop Bag (style swing) is Dark Grey colour

Swing - Dark Grey (CEL0015) $68

cellnet

$68 SAVE $11 off RRP
WebCode: CEL0014

Logitech Laser Cordless Mouse VX Revolution

The ultimate notebook mouse, VX Revolution turbocharges your digital experience with a nearly frictionless alloy scroll wheel that lets you fly through long documents at hyper-speed.

$75 SAVE $25 off RRP
WebCode: LOG3582

Verey I Anti-theft software for Mac with bonus 15" eSleeve

Have you ever thought what will happen if you lost your beloved Mac? Wondering if-only there is a way to track it? It is now possible with Verey I, a simple and ingenious software that helps keep track of your precious machine, globally.

Macbook not included

$72 SAVE $27 off RRP
WebCode: PWR0208

CITY SOFTWARE®
Black Tie Service, Plain Wrap Prices®

Comsol ServerLink Slim KVM Switches

With its slim size and ease of operation, it is an indispensable device for managing multiple PCs on your SOHO or Corporate desktop. Its compact and lightweight design fits comfortably anywhere on your desktop. Available in 2 or 4 port models. Both models include cables.

$89 | SAVE $10 off RRP
WebCode: COM0094

Belkin Hi-Speed USB 2.0 3-port hub & 15-in-1 Media Reader/Writer

The The Belkin Hi-Speed USB 2.0 3-port hub & 15-in-1 Media Reader/Writer offers you the complete desktop connectivity solution. It lets you connect up to 3 USB 1.1 or 2.0 devices at transfer speeds of up to 480Mbps .It lets you transfer files from one mediacard to another.

$60 | SAVE $19 off RRP
WebCode: BEL0392

Apple 23" Cinema HD Display

Apple Cinema Display is the perfect companion for your new Mac Pro or MacBook Pro. Featuring a sleek anodised aluminium case, one display can sit close to the next-for a virtually seamless picture.

Resolution: 1920 x 1200
Brightness: 400cd/m2
Contrast Ratio: 700:1
Response Time: 14ms
Viewing Angle: 178 / 178 H/V

20" Display
(APP0075) $854

Authorised Reseller

$1347 | SAVE $52 off RRP
WebCode: APP0076

HP DX2250 Desktop

The DX2250 offers up-to-date AMD technology designed to help deliver reliability and performance for basic business requirements. The well-built and cost-effective work tool capable of tackling the most common business applications and tasks.

- AMD Athlon 64 X2 Dual Core 4000+ 2.1GHz CPU
- 1GB DDR2 667Mhz Memory
- ATI Radeon X300 Graphics
- 160GB 7200rpm SATA Hard Drive
- DVD Burner
- Genuine Windows Vista Business
- 1 Year Warranty

FREE: HP Photosmart C4385 All-in-One

Bonus Offer

$986 | SAVE $64 off RRP
WebCode: HCP5808

Acer Power 1000 Desktop

- AMD Athlon 64 3800+ 2.4GHz
- 1GB DDR2 533Mhz
- nVidia GeForce 6150 Graphics
- 160GB 7200rpm SATA II
- DVD Dual 16x Dual Layer
- Genuine Windows Home Premium
- 1 Year Warranty

$741 | SAVE $48 off RRP
WebCode: ACD1333

HP DX2300 Desktop

- Intel Core 2 Duo E2140 1.6GHz
- 1GB DDR2 667Mhz Memory
- Intel GMA 3000 Graphics
- 80GB 7200rpm SATA
- DVD Burner
- Windows Vista Business
- 1 Year Warranty

FREE: HP Photosmart C4385 All-in-One

Bonus Offer

$920 | SAVE $50 off RRP
WebCode: HPC5800

Apple Mac Mini Desktop

- Intel Core 2 Duo 2GHz Processor
- 1GB DDR2 667Mhz
- Intel GMA950 Graphics
- 120GB 5400rpm SATA Hard Drive
- Slot-loading SuperDrive
- Mac OS X v10.4 Tiger
- 1 Year Warranty

Authorised Reseller

$1117 | SAVE $31 off RRP
WebCode: APP0312

Lenovo A55 Desktop

- Intel Core 2 Duo E6300 1.86GHz
- 1GB DDR2 667Mhz
- ATI X1300
- 250GB SATA
- DVD Burner
- Win Vista Business

3 Years warranty (year 1 onsite / 2nd &3rd Parts Only)

Free upgrade to 22" wide screen when you purchase desktop with a 19" wide screen

*See www.csw.com.au/promotions for terms and conditions. Offer ends 30/11/2007 *Monitor not included

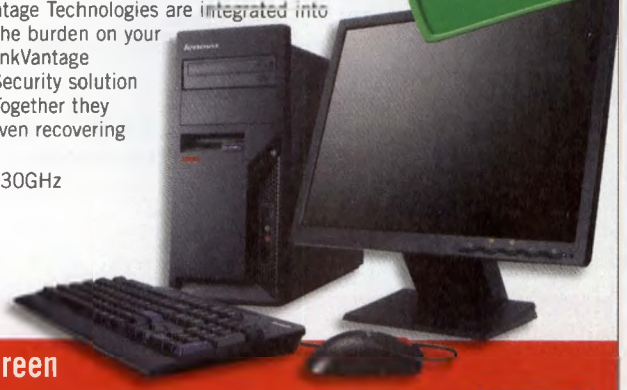
$1347 | SAVE $52 off RRP
WebCode: IBD9802

Lenovo ThinkCentre A61 9134 Desktop

Bonus Offer

Quality choice and affordability for business.

For businesses that need industry-leading technology and outstanding value. ThinkCentre A55 models suit the way you work right out of the box. Steel chassis with tool-less access simplify service. ThinkVantage Technologies are integrated into every ThinkCentre A55 system to reduce the burden on your help desk. These unique tools include ThinkVantage Productivity Center, ThinkVantage Client Security solution and ThinkVantage Rescue and Recovery. Together they make system management, security and even recovering from system crash quick and easy.



- AMD Athlon Dual Core 64 X2 4400+ 2.30GHz
- 1GB DDR2 SDRAM
- AMD RS690 Graphics Chipset
- 250GB 7200rpm SATA
- DVD Burner
- Genuine Windows Vista Business

Free upgrade to 22" wide screen when you purchase desktop with a 19" wide screen

lenovo

3 Years (Year 1 onsite / 2nd & 3rd Parts Only)

*See www.csw.com.au/promotions for terms and conditions. Offer ends 30/11/2007 *Monitor not included

$1043 SAVE $56 off RRP WebCode: IBD9810

Lenovo 3 year Onsite Warranty Upgrade For ThinkCentre Desktops

lenovo

Lenovo makes it easy to upgrade your system's original warranty, continue protection beyond the warranty period and choose the level of response you need with Lenovo ThinkPlus for Warranty and Maintenance. Accurately budget for future repair costs by purchasing the service you need, right along with your Lenovo hardware product. If your Lenovo machine is still within its original warranty period, then you can upgrade your service with a warranty service upgrade. No matter which option you select, you'll get Lenovo's outstanding service at an exceptional value. Only ThinkCentres with Year 1 onsite / 2nd & 3rd Parts Only are eligable for this unit.

$96 SAVE $3 off RRP WebCode: IBW0001

Apple iMac 20" Desktop

The all new, all-in-one iMac

Setting new standards for elegance and simplicity, the all-new, all-in-one iMac packs all its components from processor to video camera into an astoundingly thin, anodised aluminium frame.

- 2.0GHz Intel Core 2 Duo processor
- 250GB Serial ATA 7200-rpm hard drive
- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- 20-inch glossy widescreen TFT (1680 by 1050 pixels)
- Built-in AirPort Extreme wireless networking
- ATI Radeon HD 2400 XT graphics processor with 256MB GDDR3 memory

20" 2.4GHz (APP0318) **$2076**
24" 2.4GHz (APP0319) **$2487**
24" 2.8GHz (APP0310) **$3188**

Authorised Reseller

$1642 SAVE $56 off RRP WebCode: APP0317

Fuji Xerox DocuPrint C525 A - A4 Colour Laser Printer

Amazing colour and fast black and white print.

- 25 ppm Mono, 5 ppm Colour
- 600 x 600 dpi Resolution
- USB 2.0, IEEE 1284, Ethernet 10/100 Connectivity
- 200 Sheet Tray

1 Year On-Site Warranty

Fuji Xerox Printers

$398 SAVE $191 off RRP WebCode: FXP0525

HP DX7300 Desktop

hp

- Intel Core 2 Duo E6320 1.86GHz
- 1GB DDR2 667Mhz
- Intel GMA 3000
- 160GB 7200rpm SATA hard Drive
- DVD Burner
- Genuine Windows XP
- 1 Year Warranty

Bonus Offer

FREE: HP Photosmart C4385 All-in-One

*Monitor not included

$1147 SAVE $153 off RRP WebCode: HPN0002

AcerPower 1000 Desktop

acer

- AMD Athlon 64 X2 Dual Core 4000 2.1GHz
- nVidia GeForce 6150 graphics
- 1GB DDR2 533Mhz
- 250GB 7200rpm SATA II
- DVD Burner
- Genuine Windows XP Pro
- 1 Year Warranty

Includes 24" Widescreen, CA Internet Security, USB TV Tuner,

$1851 SAVE $806 off RRP WebCode: ACB0083

MGE Evolution S 1750VA UPS

High density protection for network devices. Maximum availability and flexibility - Minimum total cost of ownership. With its extremely compact size, the Evolution is the ideal solution for making the best use of the available space. Suitable protection from 1 to 15 servers.

Features:

- Universal Rack & Tower configuration 2U Density
- Allows integration of additional battery packs (Optional)

MGE

$1272 SAVE $185 off RRP
WebCode: MGE0080

Fuji Xerox WC 3119 Mono A4 Multifunction Laser Printer

Print, Copy, Scan

Fuji Xerox WorkCentre 3119 is a laser multifunction printer that's perfectly scaled for the single user.

- Print 600 x 600 dpi, Scan 600 x 2400 dpi
- 18 ppm
- USB 2.0 Connectivity
- 250 Sheet Tray
- Compatible with Win98/ME, 2000, XP, Mac, Linux

Fuji Xerox Printers

$148 SAVE $127 off RRP
WebCode: FXP0235

HP DAT72 USB External Tape Drive

- 36GB/72GB Capacity
- 3 MB/S (Native) 6MB/S (Compressed) Transfer Rate
- Native USB 2.0 Interface
- Dat72, DDS-3, DDS-4 Compatiblity

Bonus DAT 72 Tapes

$820 SAVE $487 off RRP
WebCode: HPH0976

HP ML 110 G4 Server

Manufacturer #:	448029-011
Processor:	Intel Pentium D 925 3.0GHz
Memory:	2GB DDR2 667MHz
Hard Drive:	2 x 160GB SATA Hard Drive
HDD Controller:	4-port SATA controller with Embedded RAID
Optical Storage:	48x CD-ROM drive
Ethernet:	Broadcom 5721 Gigabit NIC
Ports:	2 Serial, 2 PS/2, 1 Graphics, 1 RJ-45, 6 USB
Slot Totals:	2x 32-bit/33MHz PCI, 2 x PCI-Express slots
Form Factor:	4U Micro ATX Tower
Warranty:	1 Year

BONUS
Microsoft Small Business Server Premium 2003

$1960 SAVE $235 off RRP
WebCode: HOS0306

Acer Altos G330 Server

Manufacturer #:	G3.30166.140QE-WT8
Processor:	Intel Dual Core E2160 1.8GHz
Memory:	1GB ECC DDR2 667 Unbuffered
Hard Drive:	320GB SATA2 7200rpm
HDD Controller:	4-port SATA with RAID
Optical Storage:	16X DVD-ROM Drive
Ethernet:	Integrated Gigabit Ethernet
Ports:	4 USB, 1 Serial, 2 PS2, 1 Graphics
Slot Totals:	2x 32-bit/33MHz PCI, 2x PCI-Express slots
Form Factor:	Tower
Warranty:	3 Year

$1197 SAVE $152 off RRP
WebCode: ACE0067

HP ML115 Server

Manufacturer #:	441054-015
Processor:	AMD Opteron Processor 1210 1.8GHz
Memory:	1GB DDR2
Hard Drive:	2 x 160GB SATA Hard Drive
HDD Controller:	4-port SATA controller with Embedded RAID
Optical Storage:	48x CD-ROM drive
Ethernet:	Embedded NC320i PCI Express Gigabit Svr Adaptor
Ports:	8 USB, 1 Serial, 2 PS2, 1 Graphics
Slot Totals:	2x 32-bit/33MHz PCI, 2x PCI-Express slots
Form Factor:	4U Tower
Warranty:	3 Year

BONUS Microsoft Small Business Server Standard 2003

$1449 SAVE $192 off RRP
WebCode: HOS0289

Samsung 226BW 22" LCD Monitor

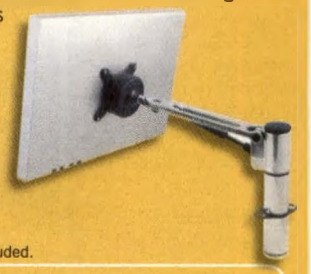
Perfect for the Windows Vista operating system. The latest games and digital video, the 16:10 aspect ratio makes the 226BW a Wide Format Wonder. With its Glossy Black finish, rounded edges and Blue Power LED the 226BW will make a style statement in your home or office.

Maximum Resolution: 1680 x 1050
Response Time: 2ms
Brightness: 300 cd/m2
Contrast Ratio: 3000:1

$526 | SAVE $273 off RRP | WebCode: SAM2260

Spacedec Acrobat Swing Arm LCD Mount - Desk Kit Combo

- Suits LCD Flat Panel
- Displays from 12" (30cm) to 22" (56cm)
- Suits 75mm x 75mm (3"x 3") and 100mm x 100mm (4"x 4") mounting hole patterns



*Monitor not included.

$212 | SAVE $27 off RRP | WebCode: ATD0008

LG L194WT 19" Widescreen LCD Monitor

World first picture enhancing Chip for LCD Monitor Real Colour Management (RMC) express natural colours Adaptive Colour and Contrast Enhancement (ACE) function to.

Maximum Resolution: 1440 x 900
Response Time: 5ms
Brightness: 300 cd/m2
Contrast Ratio: 2000:1

$316 | SAVE $113 off RRP | WebCode: LGE0091

Acer AL2216WD 22" LCD Monitor

Everything is bigger and better on the Acer AL2216WD. The Panoramic viewable display is ideal for watching DVD movies, playing Games, internet browsing, graphic design, IT programming, or working on two applications at the same time.

Maximum Resolution: 1680 x 1050
Response Time: 5ms
Brightness: 300 cd/m2
Contrast Ratio: 700:1

$410 | SAVE $69 off RRP | WebCode: ACM8008

Spacedec Acrobat Articulated LCD Mount - Desk Kit Combo

- Suits LCD Flat Panel Displays from 12" (30cm) to 22"(56cm)
- Suits 75mm x 75mm (3"x 3") and 100mm x 100mm (4" x 4") mounting hole patterns
- Supports a maximum weight of 9kg (19.8lbs)

*Monitor not included.

$262 | SAVE $13 off RRP | WebCode: ATD0005

Philips 220WS8 22" LCD Monitor

Do more, see more on a budget! With high resolution, legible text size and a larger viewing area, this ultra-slim Philips 220WS8 boosts productivity with better viewing comfort – and is ready for future upgrade to Windows Vista.

Maximum Resolution: 1680 x 1050
Response Time: 5ms
Brightness: 300 cd/m2
Contrast Ratio: 1000:1

$425 | SAVE $204 off RRP | WebCode: PHP3125

Samsung 244 24" LCD Monitor

Professional monitors should be distinctive. The excitement of a huge screen, vivid colour expression, and a stylish design complete your professionalism.

Maximum Resolution: 1920 x 1200
Response Time: 6ms
Brightness: 500 cd/m2
Contrast Ratio: 1000:1

$1678 | SAVE $321 off RRP | WebCode: SAM2440

Spacedec D-Horizontal LCD Monitor Stand

- Suits 2 LCD Flat Panel Displays from 12" (30cm) to 22" (56cm)
- Suits 75mm x 75mm (3"x 3") and 100mm x 100mm (4" x 4") mounting hole patterns
- Supports a maximum weight of 11.5kg (25.3lbs) each

*Monitor not included.

$372 | SAVE $93 off RRP | WebCode: ATD0006

2C See IT 84" Projector Screen

2C

The workhorse of the range, the See IT is a reliable, well priced pull down screen that gives you all the flexibility of the Switch IT but at a red hot price. Suitable for use in all sorts of places, and with any sort of output, from the overhead projector to computer games, the See IT will make what your looking at bright, crisp and clear.

100" (TWC0002) **$306**
117" (TWC0003) **$346**

$264 SAVE $15 off RRP
WebCode: TWC0001

Epson EMP-S5 Projector

Designed for enjoying larger than life images that fill your office, classroom or home. The new EMP-S5 Projector provides improved brightness, superb image quality and multimedia capability at an affordable price.

- Contrast Ratio: 400:1
- Brightness: 2000 ANSI Lumens
- Lamp Life: 4000 Hours
- Screen Size: 30 to 300 inch

EPSON

$1072 SAVE $27 off RRP
WebCode: EMP0005

Viewsonic 26" LCD TV

ViewSonic's HD ready N2640wb 66cm widescreen LCD TV brings brilliant, life-like colours for superb family entertainment to your home. HDMI provides extra flexibility plus crisp digital video and life-like audio quality. Intelligent image optimising technology and high-definition 1366 X 768 resolution guarantee smooth, blur-free HD motion video.

32" LCD TV
(VIE3256) **$897**

ViewSonic

$697 SAVE $511 off RRP
WebCode: VIE3257

2C Switch IT 84" Projector Screen

Roller screens are a great choice in so many environments – training rooms, classrooms, homes – wherever a screen is needed that rolls down and then out of the way at the flick of a switch. 2C takes this flexibility one step further – with the "universal size" feature.

100" (TWC0005) **$976**
117" (TWC0006) **$1037**

2C

$913 SAVE $93 off RRP
WebCode: TWC0004

Acer XD1270D Projector

An entry-level digital projector offering all the right elements at an attractive price, the Acer XD1270D is a worthwhile investment for those with an eye on portability and the bottom line. The XD1270D features 2300 ANSI Lumens brightness, XGA resolution and Digital Light Processing (DLP) technology.

- Contrast Ratio: 2000:1
- Brightness: 2300 ANSI Lumens
- Lamp Life: 3000 Hours
- Screen Size: 34 to 304 inch

FREE carry bag

acer

$1543 SAVE $356 off RRP
WebCode: ACP6947

Acer 32" LCD TV

Designed to be noticed, the Acer widescreen LCD TV provides cinema-like full screen viewing while incorporating awesome audio performance. The new range from Acer feature an analogue tuner and 2 x HDMI to complete the viewing experience. All LCD TV's in the Acer range feature a three year warranty.

acer

$1167 SAVE $32 off RRP
WebCode: ACP9100

2C Hang IT Projector Ceiling Mount

The perfect projector mounting solution which makes ceiling installations so easy.
Suitable for any projector that can be inverted and has base mounting holes.

White (TWC0008) **$164**

2C

$164 SAVE $5 off RRP
WebCode: TWC0007

Panasonic LB51NTE Projector

The PT-LB51NTEA's wireless ability completely eliminates the need for PC cable connection. You simply bring in your laptop (with a wireless LAN function) for smooth, hassle free presentations and flexible room layouts. The supplied Wireless Manager ME 4.5 software makes setup quick and easy, and a host of wireless functions complement projector applications.

- Contrast Ratio: 400:1
- Brightness: 2000 ANSI Lumens
- Screen Size: 33 to 300 inch

FREE Lamp Value $579

Panasonic

$2146 SAVE $763 off RRP
WebCode: PAN0109

LG 37" LCD TV

Experience LG's picture perfect LCD TV screen. It's wide viewing angle displays crystal clear images from whichever direction you are watching.

- Contrast Ratio: 8000:1 • Monitor Type: HD LCD TV
- Resolution: 1366 x 768 • Brightness: 450cd/m²
- View Size: 37" (93cm) • View Angle: 178°
- Response Time: 5ms(GTG)

32" LCD TV
(LGH1005) **$1850**

LG

$2280 SAVE $193 off RRP
WebCode: LGH1006

Canon PowerShot A550

Boasting a powerful Canon 4x optical zoom lens and Canon's intuitive DiG!C II processor, the 7.1MP PowerShot A550 delivers simply better pictures. With a versatile range of shooting modes, you can capture it all, from family photos to travel snaps. And best of all, these compact cameras are easy to use.

7.1 Megapixel
4x Optical Zoom
2" LCD Screen

Canon

$187 SAVE $32 off RRP
WebCode: CAN0591

Kodak EasyShare C875

Get closer to what's important. There's a lot to like about the C875

- Kodak Perfect Touch Technology
- Smart scene mode
- Advanced video features
- Panorama stitch mode

8 Megapixel
5x Optical Zoom
2.5" LCD Screen

Kodak

$261 SAVE $38 off RRP
WebCode: KOD0875

Sandisk Memory Cards

Standard SD

512MB (SIM0387) $12
1GB (SIM0388) $18
2GB (SAN0030) $32

Ultra II SD

1GB (SIM5987) $22
2GB (SIM0457) $38
4GB (SAN0098) $75

Standard Compact Flash (CF)

1GB (SIM0191) $27
2GB (SIM0690) $45
4GB (SAN0036) $77

Ultra II Compact Flash (CF)

1GB (SIM1002) $31
2GB (SIM0691) $48
4GB (SAN0023) $87
8GB (SAN0037) $167

Memory Stick Pro Duo

1GB (SAN0025) $31
2GB (SAN0028) $49
4GB (SAN0053) $85

Ultra II Memory Stick Pro Duo

1GB (SAN0065) $41
2GB (SAN0046) $59
4GB (SAN0066) $95

Olympus FE-280 Black

With an ultra-slim, stainless metal exterior and available in three brilliant colours: red, black and silver, the Olympus FE-280 represents a new generation of fun and easy digital photography.

Red (OLY0132) $272
Silver (OLY0127) $272

8 Megapixel
3x Optical Zoom
2.5" LCD Screen

OLYMPUS

$272 SAVE $27 off RRP
WebCode: OLY0131

Sony Cybershot DSCW55 - Blue

Powerful, colourful and pocket-sized, this ultra-compact camera offers superb 7.2 Megapixel imaging, Carl Zeiss 3x optical zoom lens, high ISO 1000 sensitivity for low-light shooting and Stamina battery power for up to 380 shots. A bright 2.5" LCD screen helps you compose shots, check results and read menus even in bright sunlight.

7.2 Megapixel
3x Optical Zoom
2.5" LCD Screen

SONY

$309 SAVE $20 off RRP
WebCode: SNY1278

Canon IXUS 70 Silver

The 7.1 Megapixel IXUS 70 offers a sharp combination of cutting edge technology and ultra compact style. The DiG!C III processor delivers fast performance and industry leading image quality.

Black (CAN0592) $316

7.1 Megapixel
3x Optical Zoom
2.5" LCD Screen

Canon

$316 SAVE $33 off RRP
WebCode: CAN0593

Olympus Tough MJU790 Orange

Olympus has done is again with the Tough MJU790 Digital Camera. Boasting features such as Waterproof to 3 metres, Shockproof to 1.5 metres and sporting the latest in Tough design, the Tough 790SW is hot for summer!

Midnight Black (OLY0128) $451
Artic Silver (OLY0130) $451

7.1 Megapixel
3x Optical Zoom
2.5" LCD Screen

OLYMPUS

$451 SAVE $48 off RRP
WebCode: OLY0129

Verbatim 2GB Secure Digital (SD) Card

- Available in 1GB – 4GB Capacities
- A popular removable storage solution for mobile devices
- Verbatim Limited Lifetime Warranty

1GB (VBM6033) $21
4GB (VBM6035) $73

$38 SAVE $9 off RRP
WebCode: VBM6034

Cellnet SimFlash Express Flash Card Reader / Writer

- Dedicated transflash/micro SD slot (no adaptor required)
- Sim card slot and Sim manager software included
- Fits all popular flash memory cards
- 3G compliant

cellnet

$36 SAVE $4 off RRP
WebCode: CEL0012

Verbatim 1GB Micro SD Card

A popular removable storage solution for mobile devices

- Includes adaptor for use in standard SD card slot
- Verbatim Limited Lifetime Warranty

Verbatim 2GB Micro SD Card (VBM6039) $50

Verbatim.

$25 SAVE $4 off RRP
WebCode: VBM6038

Cellnet Pilot-Mini Bluetooth Car Kit

- Fully portable from car to car or office
- Built-in noise cancelling microphone
- Supports voice dialling
- Microphone mute on/off
- Digital Signal Processor (DSP)

cellnet

$52 SAVE $7 off RRP
WebCode: PIL0002

ASUS M530w Smart Phone

Receive Instant Messages Anytime, Anyplace

In order to provide business users with the mobility and the versatility of a mobile office, ASUS has designed the new ASUS M530w Smart Phone. Packed with innovative features, the ASUS M530w allows users to send and receive messages instantly anywhere – providing vital information for users to make important and informed business decisions. The ASUS M530w supports Push E-mail and can simultaneously receive mails from the user's office Outlook mail server. It can also update their organisers and communications records for easier data management. These important features will ensure that users will never miss any important information and be able to quickly reply to work requirements – enhancing their work productivity even if they are not in the office, or caught in a meeting.

- Impressive Message Functions
- Fast Transfer Speeds
- Comprehensive Business Functions
- Plentiful Entertainment Functions

Hot

ASUS Rock Solid · Heart Touching

$813 SAVE $86 off RRP
WebCode: ASU0116

ASUS P735 Smart Phone

The P735 allows users to make full use of its 3G capabilities and integrates network connectivity, video conferencing, multimedia applications and many other business functions. With the P735, no matter where the user is globally, they can always access the information needed for informed business decisions while keeping total control over their personal life on the go.

ASUS

$843 SAVE $156 off RRP
WebCode: AUS0188

Palm Treo 750 Smart Phone

The Palm Treo 750 smartphone goes where you go. It combines a world GSM phone, email, broadband wireless and Windows Mobile all with world-renowned Palm ease. And the sleek, midnight blue design with the new soft-touch finish feels great in your hand.

$977 SAVE $222 off RRP
WebCode: USR7500

Nokia N95

It's a GPS. It's a photo studio. It's a mobile disco.It's the world wide web. It's anything you want it to be. Explore the internet with 3.5G ease. Navigate the world with interactive maps and purchasable local city guides. Download your favourite music tracks. And capture it all with 5 Megapixel clarity and Carl Zeiss optics.

NOKIA

$1042 SAVE $278 off RRP
WebCode: NOK0021

HP Ipaq HW6965 Mobile Messenger

- The HP iPAQ hw6965 Mobile Messenger provides the features and solutions you need for an outstanding mobile e-mail and messaging experience.
- Having the ability to read, respond to, and manage e-mails while you're on the road or in long meetings.

$1136 SAVE $43 off RRP
WebCode: COQ0200

Palm Tungsten E2

Introducing the sleek, stylishly designed Tungsten E2 handheld from palmOne. With a brighter, richer colour screen, it brings your calendar, contacts, documents and presentations, photos and videos to life. Plus, flash memory keeps information safe if you don't have time to recharge. There's even Bluetooth wireless technology and an MP3 player. You're going places.

$327 | SAVE $22 off RRP | WebCode: USR1040

HP HX2190 Pocket PC

Full-featured, offering excellent performance and value.

Featuring Microsoft Windows Mobile 5.0 for increased productivity and efficiency – turn anywhere into a mobile office. Intel PXA270 312 MHz high-performance processor and 192 MB total memory (128 MB ROM and 64 MB SDRAM). Up to 80 MB user available persistent storage memory.

$478 | SAVE $21 off RRP | WebCode: COQ0140

Cellnet Zetta Bluetooth Headset

- Micro sized 5cm in length
- Light weight 13 grams
- Stylish, comfortable design
- Easy one touch operation
- Bluetooth v2.0
- Noise Reduction

$33 | SAVE $6 off RRP | WebCode: CEL0032

TomTom ONE GPS Navigation

TomTom ONE combines ease of use, portability, TomTom's touchscreen technology and a sleek new design. Drivers can enjoy the benefits of a TomTom ONE immediately, thanks to TomTom's award-winning plug and drive navigation software pre-installed on a memory card.This means there is no need to download complicated software, just plug in and start using.

$489 | SAVE $10 off RRP | WebCode: TOM0006

HP RX5765 Travel Companion

Slim and stylish this GPS navigator combines personal entertainment features and travel assistant options so you can make the most of all your travels. Microsoft Windows Mobile 5.0 means improved productivity with more efficient data management. Windows Media Player 10 Mobile lets you download and enjoy MP3s and videos, as well as access streaming audio, video and Internet radio. 1 GB flash ROM, 64MB RAM.

$662 | SAVE $37 off RRP | WebCode: COQ0143

Cellnet Celleden-Wireless Stereo Headset With Neck Strap

Works as a hands free headset for any Bluetooth cellphone! Plays stereo music files from any Bluetooth devices supporting A2DP - including cellphones, PC's, MP3 players, even iPods!

$57 | SAVE $12 off RRP | WebCode: CEL0033

HTC Touch Smartphone

Featuring an easy to use touch screen and user interface, the DOPOD Touch with TouchFLO gives you unprecedented touch panel experience.

- Large 2.8" touch screen display
- Tri-band GSM with GPRS/EDGE
- 2 Megapixel camera
- Internet browsing and Push E-mail
- Multimedia capabilities
- Stereo Bluetooth 2.0 and Wi-Fi

$642 | SAVE $57 off RRP | WebCode: HTC0001

O2 Zinc Smartphone

The Xda Zinc makes sending and receiving messages a breeze with the slide-out keyboard. With its built-in Wireless LAN and Intel XScale PXA 270 Processor you'll be able to transfer files and messages easily, wherever you are. Equipped with Windows Mobile 5.0 the 3G-enabled Xda Zinc makes video calling, messaging and surfing the web faster and more reliable.

$896 | SAVE $282 off RRP | WebCode: XDA4000

H2O Waterproof Housing for iPod Nano

Rock and roll with H2O Audio's waterproof housing for your iPod Nano 2nd Gen. Submersible to three meters when paired with H2O Audio waterproof headphones. You can take your iPod swimming, surfing or running in the rain. Impact resistant so you can rock and roll with H2O Audio for your iPod Nano.

iPod not included

$107 SAVE $13 off RRP
WebCode: HT00001

H2O Waterproof Housing for iPod Shuffle

Submerse yourself in Sound with the new H2O Audio housing for your iPod shuffle 2nd Gen. Fully submersible to three meters when paired with H2O Audio's waterproof headphones, the housing is impact resistant and allows full use of the click wheel while inside. Submerse yourself in sounds with H2O Audio for your iPod shuffle.

$62 SAVE $8 off RRP
WebCode: HT00002

iHome iH8 White iPod AM/FM Clock Radio

iHome8 Dual Alarm Clock Radio for your iPod or MP3 player with Remote Control and 12 AM/FM Presets and Equaliser. What better way to Rise and Shine to your favourite tunes?

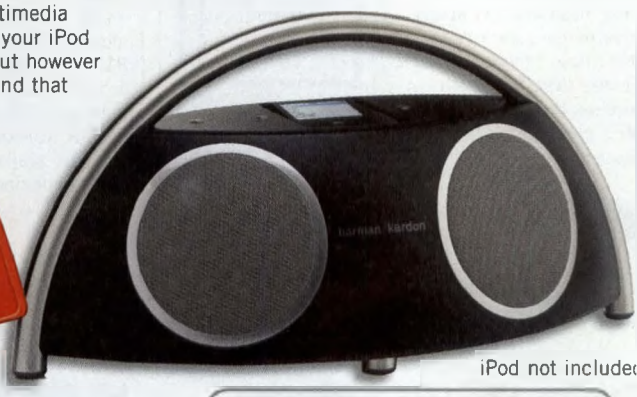
iPod not included

$176 SAVE $23 off RRP
WebCode: IH00001

Harmon Kardon Go + Play

Understated, sublimely functional industrial design with unsurpassed performance and ease of use. From its flat, protective iPod cradle and smart RF remote to its arching stainless-steel handle, this is the portable loudspeaker dock that only Harman Kardon could build. Harman Kardon Go + Play delivers tight, thunderous bass from high-excursion low-frequency drivers. Just as important, the highs are distinct and crystal clear. Go + Play is AC- or battery-operated, so it will go anywhere your iPod or other music player goes – and make your favourite music sound better when it arrives. And as a multimedia entertainment centre, it even sends your iPod photos and video to a TV monitor. But however and wherever you use it, it's the sound that sets Go + Play apart.

Hot



iPod not included

harman/kardon

$547 SAVE $43 off RRP
WebCode: JBL0002

Apple iPod Nano

The world's most popular iPod now plays video. Featuring an anodized aluminium top with a stainless steel back in four stylish colours, iPod nano looks and feels as good as it sounds. A larger, brighter display adds more brilliance to your videos, album art, and photos. And with room for up to 8 hours of video or up to 2,000 songs, it'll wow you for hours.

New

8GB Black **$269** SAVE $10 off RRP WebCode: APP0337

8GB Silver **$269** SAVE $10 off RRP WebCode: APP0334

8GB Blue **$269** SAVE $10 off RRP WebCode: APP0335

8GB Green **$269** SAVE $10 off RRP WebCode: APP0336

Authorised Reseller

4GB Silver **$192** SAVE $7 off RRP
WebCode: APP0333

Logitech AudioStation

The single sound system for any room.

Just add your iPod to create a full-function stereo that fills any room in your home with high-performance sound. Enjoy audiophile acoustics from two-way speakers, featuring 5 mm soft-dome tweeters and 10 cm long-throw woofers.

iPod not included.

$342 SAVE $158 off RRP
WebCode: LOG3590

Apple iPod Touch 8GB

New

The iPod touch begs to be held. Flick through your music with Cover Flow. Watch movies and TV shows in widescreen. Buy and download songs from the iTunes Wi-Fi Music Store. Up to 5 hours of video playback and up to 22 hours of music playback in an 8-mm-thin touchscreen. The iPod puts a world of entertainment at your fingertips.

Apple iPod Touch 16GB (APP0328) **$538**

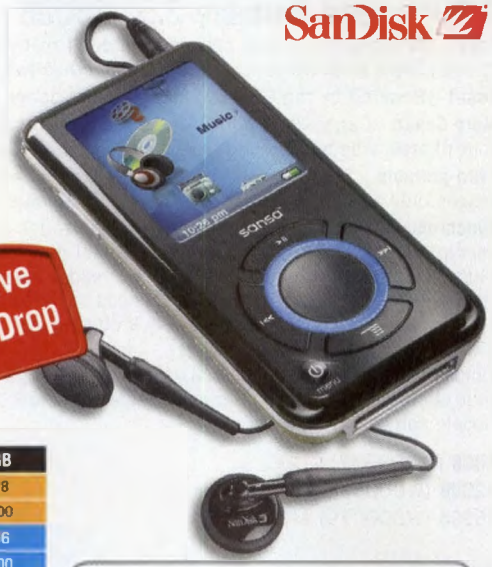
Authorised Reseller

$407 SAVE $12 off RRP
WebCode: APP0327

SanDisk e250 2GB MP3 Player

The Sansa e200 Series MP3 players are the flagship products of SanDisks audio line. Created by the leaders in flash memory, this flash-based player provides everything you need for music, photo, and video clip playback. The very attractive, sleek design includes a 1.8 TFT colour screen with advanced navigational features and an easy to use interface. You can also avoid scratches and cracks with the durable metal backing.

4GB (SAN0055) **$156**
8GB (SAN0083) **$206**



Massive Price Drop

Capacity Playback Matrix		2GB	4GB	8GB
MP3	Hours of Music Playback	32	64	128
	Number of Songs	500	1000	2000
WMA	Hours of Music Playback	64	128	256
	Number of Songs	1000	2000	4000

*Approximation's based on 4 minute songs at 128kbps MP3, 64 kbps WMA.
1MB = 1 Million Bytes, 1GB = 1 Billion Bytes

$127 SAVE $23 off RRP
WebCode: SAN0054

Cellnet SanDisk Sansa 200 Series Leather Case - Black

This leather case combines stylish protection with fine-grain leather construction. Its leather design protects your media player from scratches, dust, and finger prints.

Blue (CEL0025) **$14**
Pink (CEL0026) **$14**
White (CEL0027) **$14**

Sansa not included

cellnet

$14 SAVE $5 off RRP
WebCode: CEL0024

Cellnet SanDisk Sansa 200 Series Silicone Case - Black

The Sansa Silicone case design to fit perfectly for sansa 200 series. New Anti-slide coating applied to reduce the attrition. Openings for charger. handsfree access and pause switch.

Blue (CEL0030) **$7**
Pink (CEL0031) **$7**
White (CEL0029) **$7**

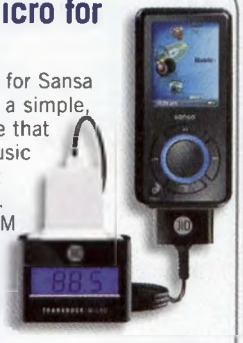
Sansa not included

cellnet

$7 SAVE $3 off RRP
WebCode: CEL0028

DLO TransDock Micro for SanDisk Sansa

The DLO TransDock micro for Sansa c200 and e200 players is a simple, easy-to-use, flexible device that broadcasts the Sansa's music over any car stereo. And it keeps your player charged. This features a powerful FM transmitter that'll pump your tunes over any FM frequency from 88.1 to 107.9.



Sansa not included.

DLO

$106 SAVE $23 off RRP
WebCode: PWR0196

DLO HomeDock Music Remote

The HomeDock Music Remote lets you dock your iPod by your stereo, then view and control all your music from the palm of your hand.
The HomeDock Music Remote not only lets you control iPod playback, but also lets you see what's playing on the bright and easy-to-read remote display.

iPod not included.

DLO

$198 SAVE $31 off RRP
WebCode: PWR0197

Cellnet i-Pod Nano and Video Power Twin Pack

Use this compact, convenient twin pack to charge your iPod at home and on the road. Simply plug the adapter into a wall or cigarette lighter outlet then connect to your iPod for recharging.
This kit is suitable for iPod Nano and iPod Video

cellnet

$32 SAVE $7 off RRP
WebCode: CEL0020

DLO TuneStik with Remote

TuneStik combines a wireless FM transmitter with a powerful RF remote control for iPod playback and control in the car, at home – anywhere there's an FM radio. What sets TuneStik apart from the pack of existing FM transmitters is the included remote control plus an integrated pass-through dock connector.

DLO iPod not included.

$99 SAVE $11 off RRP
WebCode: PWR0198

Pioneer Blu-ray Combo Drive

Play Blu-ray movies on your computer with the BDC-S02 from Pioneer. Blu-ray is the new generation of home entertainment, offering high definition video. Simply add a BDC-S02 to your system and you'll be able to enjoy Blu-ray movies and also read and write DVD's and CD's - so the BDC-S02 is the only drive you need. The Cyberlink BD Solutions software suite included provides playback, burning and authoring features, as well as the PlayMovie plug-in for Windows Media centre.

Pioneer

$432 SAVE $47 off RRP
WebCode:PIO0092

Pioneer Blu-ray Writer

The Pioneer BDR-202 Blu-ray Disc writer is the all in one solution for anyone wanting to create high quality content for Blu-ray Disc, DVD or CD. Offering revolutionary 4x burning speed, the BDR-202 can create a full BD-R 25GB disc in around 25 minutes. The BDR-202 comes bundled with the CyberLink BD Solution software including playback, burning and authoring features, as well as the PlayMovie plugin for Windows Media Centre.

Pioneer

$823 SAVE $76 off RRP
WebCode: PIO0093

WD Passport Portable 2.5" 250GB

Easy - Installation is a snap because you don't really "install" this drive; you just plug it in and it's reac to use. There is no CD to install; the included software loads from the drive the first time you plug it in

Smart - Powered by the USB bus. No separate power supply is needed.

More Space - Capacities up to 250 GB means you can take even more of your photos, videos, files and music with you wherever you go.

Ultra-portable - This compact drive fits easily in your pocket or purse, weighs only a few ounces and holds tons of valuable data.

Synchronized and Secure - WD Sync synchronization and encryption software lets you take your critical data with you. Plug WD Passport into any PC, edit files, read e-mail, and view photos. Then sync all of your changes back to your home or office computer. Your data is protected with 128-bit encryption. (Windows only)

Includes Google software - Search your drive, manage your photos, and simplify Web searches with included Google software. (Windows only).

80GB (WDD0077) **$123**
120GB (WDD0078) **$145**
160GB (WDD0079) **$183**

WD Western Digital

$267 SAVE $62 off RRP
WebCode: WDD0092

SanDisk Cruzer Micro U3 4GB

SanDisk Cruzer Micro design is a small, smart and secure USB Flash Drive.

- Small, compact light weight design
- New retractable USB slider eliminates the need for caps
- U3 smart enables you to take your portable applications on the go

1GB (SAN0060) **$22**
2GB (SAN0061) **$33**

SanDisk

$62 SAVE $8 off RRP
WebCode: SAN0062

Memorex 80GB Ultra TravelDrive

The Ultra TravelDrive 2.5" hard drive offers 80GB, 120GB or 160GB of storage and back-up capacity for your data, photos, music and video, all in a stylish device that fits easily into the palm of your hand.

160GB (MEM0020) **$221**
120GB (MEM0021) **$191**

Memorex

$131 SAVE $38 off RRP
WebCode: MEM0022

Verbatim Store n Go 8GB USB Drive

Store n Go USB drives make transporting and sharing files simple and convenient

- 1GB - 8GB Capacity
- Ultra Slim Product Design for stacked USB ports
- Security feature to protect sensitive data
- Vista ReadyBoost compatible

1GB (VBM5138) **$48**
2GB (VBM0161) **$92**
4GB (VBM9523) **$74**

Verbatim.

$147 SAVE $12 off RRP
WebCode: VBM6030

LacCie 1260GB Porsche Mobile Drive

The LaCie Mobile Hard Drive is portable so you can bring your data with you anywhere. Made with a durable exterior to withstand life on the go, this sleek drive lets you safely travel with all your personal data.

250GB (LAC1286) **$287**

LACIE

$162 SAVE $87 off RRP
WebCode: LAC9860

LaCie Porsche High Speed USB Hard Drive 500GB

World-famous design

Exclusively designed by the renowned design agency Porsche Design GmbH, the LaCie Hard Drive exhibits world-class style and performance. The result of decades of technological expertise, these drives feature state-of-the-art design and awesome performance.

High-speed downloads

The LaCie Hard Drive offers the fast interface transfer rates (up to 480Mbits/s using Hi-Speed USB 2.0 connection) that are required for jobs like downloading digital photos, saving MP3s or transferring home videos from a camcorder.

- Save your files, photos, MP3s & videos
- Fast interface transfer rate: up to 480Mbits/s
- Simple setup; easy-to-use
- Lightweight, durable & stackable

320GB (LAC1810) **$162**

BEST PRICES IN OZ

LACIE

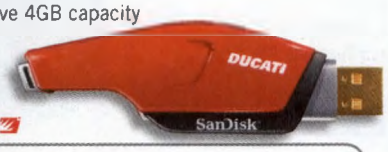
$228 SAVE $271 off RRP
WebCode: LAC1066

SanDisk Extreme Ducati USB 4GB

Passion for Performance

SanDisk has teamed with Ducati Corse MotoGP to launch the most unique USB Flash Drive to date.

- Distinctive design inspired by Ducati motorcycles.
- Fast 20MB/sec sequential read/write speed.
- The fastest consumer USB Flash Drive SanDisk offers.
- Massive 4GB capacity



SanDisk

$132 SAVE $17 off RRP
WebCode: SAN0104

WD My Book Essentials USB HDD 320GB

They're your photos, your music, your videos, your important files. Make extra room for them and keep them safe on My Book Essential Edition USB 2.0 external hard drive from WD. Easy to set up, easy to use - this drive is all about simplicity.

500GB (WDD0085) **$232**

WD Western Digital

$188 SAVE $12 off RRP
WebCode: WDD0084

WD My Book Premium USB HDD 500GB

Small, elegant, and easy to use are just a few words that describe My Book Premium USB/FireWire external hard drives from WD. Includes backup software, capacity gauge and room for all your valuable data, music, photos, and movies.

320GB (WDD0080) **$232**
1TB (WDD0082) **$582**

WD Western Digital

$276 SAVE $24 off RRP
WebCode: WDD0081

Iomega MiniMax Desktop HDD

Add 500 GB of capacity to your Mac or PC with the Iomega MiniMax Desktop Hard Drive. It's compact, stackable form takes up minimal space but provides maximum storage to manage, organize and protect your digital photos, music and movies in stylish simplicity. – save up to 2,000,000 photos, 9,250 hours of music, or 780 hours of video.

iomega

$297 SAVE $39 off RRP
WebCode: IOM0003

Seagate Desktop Hard Drives

Description	WebCode	Price
80GB PATA	(SGA0344)	$74
80GB SATA II	(SGA0347)	$76
160GB PATA	(SGA0209)	$89
160GB SATA II	(SGA0210)	$95
320GB PATA	(SGA0916)	$138
500GB PATA	(SGA0173)	$249
750GB PATA	(SGA0166)	$396
750GB SATA II	(SGA0165)	$380
1TB SATA II	(SGA0178)	$602

Seagate Cuda 7200.10 320GB Sata II 16MB

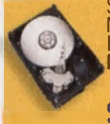
$144
WebCode: SGA0917

Seagate Cuda 7200.10 500GB SATA II 7200 16MB

$251
WebCode: SGA0174

Seagate Notebook Hard Drives

Description	WebCode	Price
60GB PATA	(SGA0277)	$92
100GB PATA	(SGA0338)	$117
100GB SATA II	(SGA0339)	$121
120GB PATA	(SGA0340)	$138
120GB SATA II	(SGA0341)	$138
160GB PATA	(SGA0317)	$177
160GB SATA II	(SGA0319)	$190
200GB SATA II	(SGA0421)	$367



Seagate Notebook Internal Hard Drive 80GB PATA

$112
WebCode: SGA0918

Seagate ST980811AS MOMENTUS 2.5 80GB SATA 5400RPM 8M

$112
WebCode: SGA0337

BullGuard Internet Security 7.0 (OEM) 1 GB Free Backup

BullGuard Internet Security is a complete security solution which protects PCs and laptops from online threats like hackers, spam, viruses and spyware.

- Complete, all-in-one security
- Online backup feature included
- 24/7 access to BullGuard Support
- 3 PC license

$22* When purchased with any hard drive on this page
WebCode: BUL0004

Iomega Rev USB Drive 70GB

Safer, Smarter, Better Backup

- Server-Level Tape Replacement for SMB & SOHO users
- Desktop Backup for SMB, SOHO and Individuals
- A perfect solution for desktop users with large file requirements and the need for removability and SMB customers with distributed desktop PCs
- Large File Users in Vertical Markets

$753 SAVE $146 off RRP
WebCode: IOM3496

Imation Odyssey Dock with 80GB Cartridge

The Odyssey Removable Hard Disk Storage System is designed to help small offices and home offices meet the escalating challenges of data protection by providing fast backup, accurate restores and full disaster recovery with minimal effort. The Imation Odyssey removable hard disk cartridge capacities range from 80GB to 160GB. The docking station accommodates all disk capacities and is scalable to future capacities, making the Imation Odyssey Removable Hard Disk Storage System a sound investment for years to come.

80GB Cartridge (MMM0420) **$136**
120GB Cartridge (MMM0421) **$164**
160GB Cartridge (MMM0422) **$216**
Dock with 120GB Cartridge (MMM0419) **$397**

$307 SAVE $88 off RRP
WebCode: MMM0418

Iomega 150D Desktop StorCentre Network Storage 1TB

A cost-effective, terabyte-scale small office NAS with hot-swap disk drives. The best way to manage, share and protect business critical information in a networked environment. Available in 1TB and 2TB capacities with RAID protection for high data availability and minimal downtime.

- Cost-effective, terabyte-scale small office NAS server
- RAID data protection with automatic rebuilds
- ADS support for seamless Windows domain integration
- Works with Windows, Mac and Linux clients
- 4 x 250GB SATA or 4 x 500GB Hot Swappable Removable Drives
- Linux Operating System

2 Terabyte (IOM5492) **$1641**

$1098 SAVE $401 off RRP
WebCode: IOM5491

D-Link DNS-323 - 2 Bay Network Storage Enclosure

- Secure and share your digital files
- Insert either one or two Sata hard drives without using any tools or attaching any cables
- Protect your important files by making regular backups to mirrored hard drives

$316 SAVE $84 off RRP
WebCode: DLK0066

WD My Book World Edition 500GB HDD, Ethernet

Add this unique remote-access storage system to your wired or wireless network and you'll have a surprisingly simple and secure way to access and share data.

1 Terabyte (WDD0088) **$623**
1.5 Terabyte (WDD0091) **$936**

$296 SAVE $104 off RRP
WebCode: WDD0086

NETGEAR ReadyNAS 1Terabyte Gigabit Network Storage (4x250GB)

- 4 Serial ATA channels
- Compatible with SATA and SATA II HDD
- Hot swappable and lockable trays
- Gigabit Ethernet
- LCD display
- 3 USB 2.0 ports
- 256MB Memory

$1552 SAVE $567 off RRP
WebCode: NTG7997

LaCie 500GB Ethernet Disk Mini

With Gigabit Ethernet for file sharing and USB 2.0 for personal storage, the versatile Ethernet Disk mini works with or without a network. Universally accessible on every wired or wireless network, this drive is capable of sharing files between Windows, Mac and Linux users.

1TB (LAC9869) **$537**

$357 SAVE $112 off RRP
WebCode: LAC9868

NETGEAR Digital Entertainer EVA 8000

Access and enjoy your digital entertainment easily on your TV and HDTV

- Streams movies, videos, music, Internet radio, and photos from your home PCs and storage devices to your HDTV
- Automatically finds all the digital media files on your home network and organizes them into an easily accessible library
- Easy set up using an on screen TV wizard for a fun entertainment experience

Digital Entertainment Supported Media Formats		
Audio	Video	Photo
MP3	MPEG1	JPEG
WAV	MPEG2	BMP
WMA	MPEG4	PNG
ACC (unprotected)	AVI	TIFF
FLAC	WMV	
	XVID	

HDMI HIGH-DEFINITION MULTIMEDIA INTERFACE

NETGEAR

$485 | SAVE $114 off RRP | WebCode: NTG7992

Sarotech 2.5" Multimedia Player

DVP-260 is a stylish and compact portable multimedia player. It gives you the freedom to playback all your favourite video and audio files anywhere you go - at home, hotel room, in the office or even in the car!

2 Year Warranty

80GB (PWR0200) $242
120GB (PWR0201) $286
160GB (PWR0202) $323

$162 | SAVE $37 off RRP | WebCode: PWR1099

Microsoft LifeCam VX-6000

Communicate with friends and family as if they were in the room with you. See the smiles clearly with 640 x 480 pixel video resolution. High Definition video and photos show you in the best light. See the smiles clearly with up to 1.3MP Video Calling.

Microsoft

$107 | SAVE $43 off RRP | WebCode: MST8425

Logitech QuickCam Pro for Notebooks

The ultra-compact Logitech QuickCam Pro for Notebooks uses Carl Zeiss optics with autofocus to deliver 8-megapixel, razor sharp photos-even in extreme close-ups. RightLight 2 intelligently adjusts to produce the best possible image.

Travel case and desktop stand included

Logitech

$139 | SAVE $41 off RRP | WebCode: LOG3631

Logitech ClearChat Style Headset

Customise your headset with interchangeable colors. Choose from red, blue, orange or basic black. Behind-the-head design: gives increased comfort for extended use.

Logitech

$24 | SAVE $16 off RRP | WebCode: LOG3635

Compro VideoMate T100 Digital PCI TV Tuner Card With Analog Video Capture

Compro VideoMate T100 is an advanced digital TV tuner card with Philips 9-bit ADC chip and low-profile card design to provide free-to-air HDTV quality digital terrestrial TV reception.

COMPRO TECHNOLOGY

$72 | SAVE $27 off RRP | WebCode: ANY0356

Elgato EyeTV Digital TV Tuner for Mac

Enjoy digital television on your Mac with EyeTV the smallest and most advanced Digital TV Recorder for the Mac. The included award-winning EyeTV software enables you to:

- Rewind, fast forward, and pause live digital TV
- Browse EyeTV menus in Full Screen mode with an Apple Remote

elgato

$138 | SAVE $11 off RRP | WebCode: ELG0007

Belkin Gold 7 Way Surge Protector

The Gold Series 7-way is perfect for professional workstations, laser printers, modems, home theatre systems, and everyday household electronics. Offering 3240 Joules, AC, phone/fax/modem, coaxial & cable TV/Broadband (F-type) protection, 360° rotating plug with insulated pins, cable management, and recessed sockets. The Gold Series comes with an Unlimited Lifetime Connected Equipment and Data Recovery Warranty.

BELKIN

$127 SAVE $63 off RRP
WebCode: BEL0254

Belkin Home Series 4 Way Surge Protector

The Home Series is perfect for entry-level computers, printers, ADSL modems, audio video, and everyday general household electronics. Offering up to 1034 Joules, AC/phone, fax/modem, cable-broadband protection, cable management, recessed sockets, and insulated pins, the Home Series comes with up to a $75,000 Lifetime Connected Equipment Warranty.

BELKIN

$54 SAVE $36 off RRP
WebCode: BEL0248

Belkin Home Series Surge Cube

The Belkin SurgeMaster is your premiere solution for clean, safe power protection and the industry's best in construction, ratings, and safety standards.

- Provides greater spike and lightning absorption with higher maximum spike current ratings
- Helps ensure child safety with recessed sockets and insulated pin plugs
- Comes with Belkin Lifetime and Connected Equipment Warranties

BELKIN

$22 SAVE $8 off RRP
WebCode: BEL0244

Logitech Squeezebox

The new, third-generation Squeezebox is the easiest way to listen to the music stored on your Mac or PC or virtually any internet radio station on your stereo. Squeezebox is a study in down tempo, modern design appropriate for any setting. It is a joy for the eyes as well as the ears.
Set-up is easy, so you'll be listening to your favourite music in minutes.

Squeezebox features:

- High fidelity 24-bit Burr-Brown DAC
- Digital optical, coax, and analogue connections
- True 802.11g wireless and Ethernet ports
- Plays MP3, WAV, FLAC, WMA, AAC, and Ogg files from your computer
- Stunning blue-white display with graphic visualizers
- Search 100,000 song libraries in seconds
- Access virtually any internet radio station and RSS feeds anytime, even without a computer
- Works with iTunes, MusicMagic, Rhapsody, Live365, Radio IO, Shoutcast, Windows Media radio
- Clock with 7 day alarm

Logitech

$387 SAVE $113 off RRP
WebCode: LOG3637

Logitech Z-10 Interactive Speaker System

See it. Touch it. Hear it.

With built-in touch-sensitive multimedia controls and a backlighted display that shows digital-music track information, a clock, volume and more, these trophy speakers are meant to be touched and seen.

Logitech

$208 SAVE $91 off RRP
WebCode: LOG3593

Logitech Z-4 Speakers

The Z-4 speaker system features a modern audio inspired design with high-gloss and cast metal finish. Award-winning pressure driver subwoofer technology delivers unparalleled distortion-free bass and the sleek satellites feature one active and two pressure drivers.

Logitech

$128 SAVE $42 off RRP
WebCode: LOG3520

JBL Creature Speakers Black

JBL's Creature II three piece speaker system produces high-quality stereo sound for movies, MP3's, movies and gaming experiences. Featuring cutting-edge sci-fi design and superior sound performance, JBL Creature II is a unique "plug and play" solution, compatible with all Macs and PCs.

White (JBL0008) **$186**
Blue (JBL0007) **$186**
Aluminium (JBL0005) **$186**

JBL

$186 SAVE $14 off RRP
WebCode: JBL0006

JBL Spyro Speakers (Retro Blue)

JBL Spyro is a powerful, compact 2.1-channel system that looks and sounds like no other personal sound system out there. With a pair of delicately beautiful satellites and an innocent-looking subwoofer, JBL Spyro components may bring shrinking violets to mind.

White (JBL0043) **$212**
Black (JBL0040) **$212**
Fuchsia (JBL0041) **$212**

JBL

$212 SAVE $18 off RRP
WebCode: JBL0042

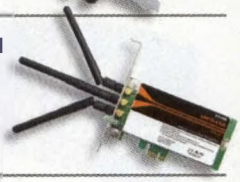
D-Link DWA-140 RangeBooster N USB Adapter

$115 SAVE $25 off RRP WebCode: DLK0090

D-Link DWA-547 RangeBooster N 650 Desktop Adapter

$113 SAVE $23 off RRP WebCode: DLK9205

D-Link DWA-556 Xtreme N PCI Express Desktop Adapter



$131 SAVE $29 off RRP WebCode: DLK0091

D-Link DWA-643 Xtreme N Notebook ExpressCard

$131 SAVE $29 off RRP WebCode: DLK0092

D-Link

D–Link Xtreme N Gigabit Router (DIR–655)

The D-Link Xtreme N Gigabit Router is a draft 802.11n compliant device that delivers up to 300Mbps and superior wireless coverage for larger environments & bandwidth-intensive applications. Backwards compatible with 802.11b/g, connected to a Cable/DSL modem provides high-speed internet access to PC's, gaming consoles and media players. Inc. 4-port Gigabit switch & QoS Prioritisation Technology.

$241 SAVE $59 off RRP WebCode: DLK0064

NETGEAR 85 Mbps Powerline Bundle

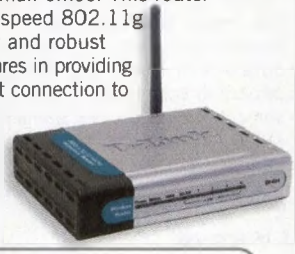
The XE104 Powerline 4-Port Ethernet Adapter turns any power outlet into a 4-port home network connection. And, because there is no software to install, the XE104 is easy to set up. The XE104 adapter extends your network to provide connections without the cost or hassle of running new wiring.

NETGEAR

$194 SAVE $85 off RRP WebCode: NTG7989

D–Link 54Mbps Wireless Router (DI–524UP)

An advanced but affordable networking solution for home and the small office. This router combines the high-speed 802.11g wireless technology and robust firewall security features in providing a broadband Internet connection to a small workgroup.



D-Link

$117 SAVE $33 off RRP WebCode: DLK9988

Billion BiPAC 7300G Router

ADSL2+ 4 Port Modem Router with Annex M, Firewall, Q&S and Wireless. The ideal internet connectivity solution for the residential and SOHO market.

APC Editor's Choice Award June 06

APC Best Value Award January 07

BILLION

$132 SAVE $37 off RRP WebCode: BIL0026

TRENDNET Internet Camera with Audio

TV-IP201 Internet audio Camera Server is the perfect device for remote monitoring and transmitting real-time events over the Internet. The TV-IP201 functions as a video/audio/ surveillance camera allowing you to view live events with your web browser via Internet or Intranet. Up to 16 cameras can be remotely managed with the bundled IP View software.

TRENDnet

$287 SAVE $53 off RRP WebCode: TDN0177

NETGEAR WGR614 + WG111 - 54 MBps Wireless Router Bundle

Speed up your wireless network to 54 Mbps, and access it through the external USB interface of your desktop or notebook PC.

NETGEAR's 54 Mbps Wireless Router and USB 2.0 Adapter kit gives your network a power boost in the easiest way possible. For blazing-fast 54 Mbps wireless speeds and impressive range up to five times faster than 802.11b, all you need to do is hook up this simple-to-install high-speed router and plug in the pocketknife-sized USB adapter, on either your desktop or notebook PC.

NETGEAR

$103 SAVE $26 off RRP WebCode: NTG7274

Apple AirPort Extreme

Introducing the new AirPort Extreme Base Station, the perfect wireless solution for home, school and business. As it blankets your space with a blazing fast, secure wireless network, it opens up a world of possibilities for home entertainment, backups, printing and more.

Authorised Reseller

$248 SAVE $11 off RRP WebCode: APP0261

Comsol Ethernet Patch Cables

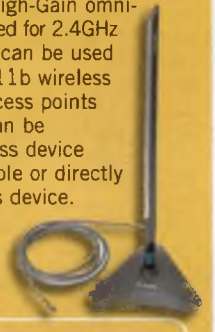
- **Comsol 0.5m RJ45 Cat 6 Patch Cable (Blue)** (COM9030) $7
- **Comsol 1 mtr RJ45 Cat 6 Enhanced Patch Cable Blue** (COM9045) $10
- **Comsol 3mtr RJ45 Cat 6 Enhanced Patch Cable Blue** (COM0112) $11
- **Comsol 5mtr RJ45 Cat 6 Enhanced Patch Cable Blue** (COM9090) $22
- **Comsol 10mtr RJ45 Cat 6 Enhanced Patch Cable Blue** (COM9105) $27
- **Comsol 25m RJ45 Cat 6 Patch Cable (Blue)** (COM0118) $35

COMSOL

D-Link Omni Directional Indoor Antenna 7dBi (ANT24-0700)

The ANT24-0700 is a High-Gain omni-directional antenna designed for 2.4GHz ISM band indoor use. It can be used with 802.11g and 802.11b wireless LAN devices such as access points and remote routers. It can be connected to your wireless device through an extension cable or directly attached to your wireless device.

5dBi Antenna (DLK0141) $63



D-Link

$77 SAVE $23 off RRP
WebCode: DLK9245

Belkin N1 Wireless Router

Providing greater range and faster speeds, N1 Wireless offers a quick and efficient way for people to distribute video, music, photos, and files among the networked computers in their home. The built-in Network Status Display shows the status of your network. The icons represent each component of your network and show you whether or not each device is working properly.

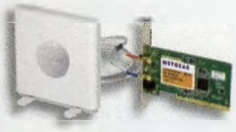
BELKIN

$237 SAVE $43 off RRP
WebCode: BEL7000

NETGEAR RangeMax Next Wireless Notebook Adapter (WN511B)

$119 SAVE $60 off RRP
WebCode: NTG7936

NETGEAR WN311B - RangeMax Next Wireless N PCI Adaptor



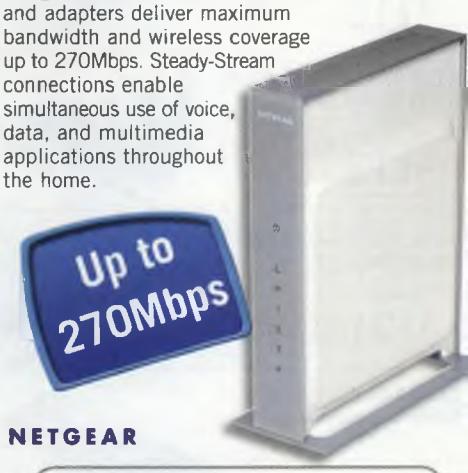
$119 SAVE $60 off RRP
WebCode: NTG7951

NETGEAR WN121T - RangeMax Next Wireless-N USB 2.0 Adapter

$158 SAVE $41 off RRP
WebCode: NTG7980

NETGEAR RangeMax NEXT Wireless Router (WNR834B)

RangeMax NEXT wireless routers and adapters deliver maximum bandwidth and wireless coverage up to 270Mbps. Steady-Stream connections enable simultaneous use of voice, data, and multimedia applications throughout the home.



NETGEAR

$179 SAVE $70 off RRP
WebCode: NTG7935

Linksys Wireless-N PCI Adapter (WMP300N)

$130 SAVE $30 off RRP
WebCode: LNK5545

Linksys Wireless-N Notebook Adapter (WPC300N)

$130 SAVE $30 off RRP
WebCode: LNK5546

Linksys Wireless-N USB Adapter (WUSB300N)

$130 SAVE $30 off RRP
WebCode: LNK1235

Linksys Wireless-N Gigabit Router With Storage Link

Internet-sharing Router and 4-port Gigabit Switch, with a built in speed and range enhanced Wireless Access Point. Also connects hard drive or flash-based USB storage devices directly to your network to share music, video, or data files MIMO technology uses multiple radios to create a robust signal that travels up to 4 times farther.

LINKSYS

$296 SAVE $54 off RRP
WebCode: LNK6234

HP ProCurve 530 Access Point

Ideal for branch or satellite office deployments, the ProCurve Access Point 530 is an intelligent edge, dual-radio access point with simultaneous support for IEEE 802.11a and IEEE 802.11g standards, as well as dual IEEE 802.11g radio operation.

ProCurve

$1047 SAVE $396 off RRP
WebCode: HPE4941

D-Link DWL-3200AP - Managed Access Point

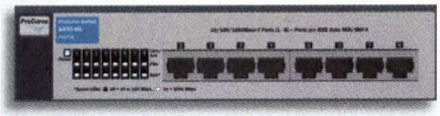
D-Link unveils its new AirPremier DWL-3200AP 802.11g 108Mbps Managed Access Point, designed specifically for business-class environments such as large or enterprise corporations. Operable as either an AP or Wireless Bridge, and coupled with safety approved metal chassis and advanced security.

D-Link

$339 SAVE $91 off RRP
WebCode: DLK6041

ProCurve Switch 1400 Series 24 Port

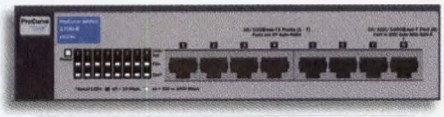
ProCurve's new 1400 Series of unmanaged and fanless, silent operation Gigabit switches deliver high performance and reliability with plug-and-play simplicity, backed by a Lifetime HP Warranty.



$537 | SAVE $73 off RRP | WebCode: HPE9078

ProCurve Switch 1700 Series 8 PORT

The ProCurve 1700 Series consist of fanless, silent operation 10/100 switches with Gigabit uplinks that are easy to configure, integrate, and manage, via an intuitive Web interface.

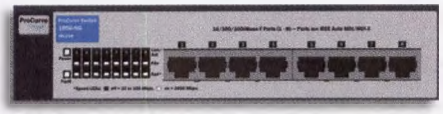


$155 | SAVE $21 off RRP | WebCode: HPE9079

ProCurve Switch 1800 Series 8 Port

The ProCurve Switch 1800 is designed for affordable Gigabit performance and minimal network configuration, while being quiet and unobtrusive.

ProCurve



$276 | SAVE $23 off RRP | WebCode: HPE9029

For any special Education (K-12) or Corporate pricing please call our managed accounts team on 1300 761 761

ProCurve Switch 2600 Series

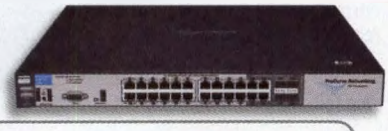
The ProCurve Switch 2600 series is a collection of low-cost, stackable, multi-layer, managed switches with 48, 24, or 8 auto-sensing 10/100 ports and dual-personality ports for 10/100/1000 or mini-GBIC connectivity. The ProCurve Switch 2650-PWR, 2626-PWR, and 2600-8-PWR are IEEE 802.3af–compliant for Power over Ethernet and provide up to 15.4 W per port. A redundant external power supply is also available as an accessory.

ProCurve

$3096 | SAVE $780 off RRP | WebCode: HPE8164

ProCurve Switch 2900 Series

The ProCurve Switch 2900 series consists of two switches: the ProCurve Switch 2900-24G with 24 10/100/1000 ports and the ProCurve Switch 2900-48G with 48 10/100/1000 ports. Both have 4 dual-personality ports for 10/100/1000 or mini-GBIC connectivity. In addition, by including four integrated 10-Gigabit Ethernet (two CX4 ports and two X2 slots)



$4984 | SAVE $1083 off RRP | WebCode: HPE3634

Trendnet 24 Port Gigabit Web Smart POE Switch

TPE-224WS 26-port Smart Switch integrates Power over Ethernet (PoE) and network management features into a cost effective and scalable solution. The TPE-224WS reduces equipment cost by delivering data and power over existing network cable infrastructure.

TRENDnet

$1068 | SAVE $430 off RRP | WebCode: TDN0230

Trendnet 8 Port POE Fast Ethernet Switch

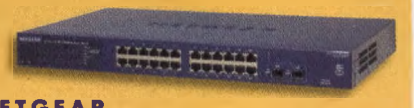
8-Port Smart Switch integrates 4-Ports of Power over Ethernet (PoE) and network management features into a cost effective and scalable solution. The TPE-S44 reduces equipment cost by delivering data and power over existing network cable infrastructure.

TRENDnet

$146 | SAVE $28 off RRP | WebCode: TDN0236

NETGEAR GS724T ProSafe 24 Port Gigabit Smart Switch

The Netgear GS724T Smart Switch comes with simple switch management at no extra cost. This 24-port Gigabit switch is high on value and capability. Each port is capable of powering 2000 Mbps of data throughput in full duplex mode, plus two optional fibre ports, it provides fast backbone and connects servers or power users, delivering large amounts of multimedia, image, and video information in no time at all.



NETGEAR

$644 | SAVE $185 off RRP | WebCode: NTG7158

NETGEAR GS108T - ProSafe 8 Port Gigabit Desktop Switch

Joining NETGEAR's family of Gigabit Smart Switches with web-based management, this 8-port Gigabit switch is high on value and capability. With 8 10/100/1000 Mbps ports and support for Jumbo frames, capable of powering 2000 Mbps of data throughput in full-duplex mode, it is ideal for small offices or extensions and connects high speed servers or power users.

ProCurve

$241 | SAVE $58 off RRP | WebCode: NTG7993

Billion BiPAC 7404VGPM VOIP Router

ADSL2+ 4 Port Modem router with Annex M, Firewall, QOS, Wireless and VOIP. 2 VOIP Ports with PSTN fail over and the Least Cost Routing gateway, allowing up to 8 different VOIP service plans with the cheapest calls.The perfect solution for the small business looking to upgrade to VOIP and save serious money with phone bills.

- APC Editor's choice Award June 06
- APC Best Overall Award January 07

BILLION

$274 | SAVE $25 off RRP | WebCode: BIL0027

Canon LiDE 25 Scanner

Affordable, quality scanning made easy

- 1200 x 2400 dpi optical resolution with 48-bit colour depth for sharp, accurate scans.
- Three one-touch buttons Scan/Copy/E-mail for easy operation.
- Compact and stylish design.
- USB powered.
- Advanced Z-Lid accommodates scanning of bulky items such as books with ease.

Canon

$99 SAVE $20 off RRP
WebCode: CAN0403

Epson Perfection V200 Scanner

The Epson Perfection V200 Photo flatbed scanner is sleek and stylish in appearance and contains a Matrix CCD sensor that features an Optical Resolution of 4800dpi, an Optical Density of 3.2 Dmax and Transparency Unit for film scanning.

EPSON

$222 SAVE $27 off RRP
WebCode: EPS0200

HP G4010 Photo Scanner

World's First 6-colour Scanner

Enjoy high-definition scan quality that delivers vivid and realistic images with each scan. With HP's exclusive 6-colour, 96-bit photo scanning, you can make sure your photos and images are as true to the original as possible.
In addition to amazing colour accuracy, you can capture every fine detail with up to 4800 x 9600 dpi resolution.

$344 SAVE $25 off RRP
WebCode: HPS1957

HP Officejet Pro L7580 All-in-One Printer

High speed, high volume laser-quality printing at an amazing low cost.

Get more than just fast print, fax, scan and copy capabilities. The high-performance HP Officejet Pro L7580 All-in-One comes with built-in networking and produces laser-quality printing at a lower cost than multifunction lasers.

- 50-sheet duplexing Automatic Document Feeder helps you increase efficiency.
- Scan and store files direct to memory cards or USB storage devices.
- Standard 250-sheet paper tray, plus optional 350-sheet tray to increase capacity.
- Reduce paper usage by as much as 50% with two-sided print accessory.
- Use high capacity individual ink cartridges for highvolume business printing.
- Built-in wired networking for greater productivity.

$100 casback via redemption.
Offer ends October 31st 2007

$460 SAVE $39 off RRP
WebCode: HPS7580

Epson Stylus CX5500 Multifunction Inkjet Printer

The Epson Stylus CX5500 is the multifunction printer delivering versatility and flexibility in the home and small or home office. It combines economical Individual ink cartridges, high resolution printing.

EPSON

$88 SAVE $11 off RRP
WebCode: EPI0055

Canon PIXMA iP3300 Colour Bubble Jet Printer

The PIXMA iP3300 Inkjet printer is capable of ejecting microscopic 2 picolitre ink droplets and achieving 4800 x 1200 dpi to ensure even smoother gradation by eliminating graininess. Cost-saving individual ink tanks means you'll only need to replace the colour that runs out.

Canon

$98 SAVE $11 off RRP
WebCode: CAN0518

HP Photosmart C5280 All-in-One

Faster. Easier. Smarter. The new photo

Get more speed, functionality and intelligence with the new HP Photosmart C5280. Featuring faster printing speeds and a built-in 2.4-inch colour graphics display, photo and document printing is a breeze.
Thanks to optional 6-ink colour printing1.

Free Photobook $49 Value via redemption.

$185 SAVE $14 off RRP
WebCode: HPS5280

Canon PIXMA MP530 Multifunction Printer

Versatile All-in-One printer for superior office convenience. Print, copy, scan and fax

- Increase productivity with fast document printing at up to 29 ppm black and 19 ppm colour
- High-speed 6"x 4" photo prints in approx. 51 seconds

Canon

$363 SAVE $36 off RRP
WebCode: CAN0585

Inkjet & Mono Laser Printers

HP LaserJet 1160 Mono Laser Printer

If you're looking for reliability in a high-quality, black-and-white printer, this model fills the bill. The HP LaserJet 1160 performs admirably with all types of paper, including matte, soft gloss, and labels. With support for HP PCL 5e, it plays well with your existing office setup. Plus, you won't have to break the bank to bring it home.

- Boost your office productivity with print speeds of up to 20 pages per minute; HP's instant-on technology brings out the first page in less than 8.5 seconds
- Get reliable results with the powerful 133MHz processor and 16MB RAM (no worrying about running out of memory before the job is complete)
- Get professional-looking documents with the sharp 1200 dpi effective output and HP's Ultraprecise printing technology
- Conserve desk space with the compact design (no protruding tray)
- Tailor your media-handling to your office needs with the large-capacity 250-sheet input tray, single-sheet multipurpose input slot, and 125-sheet output bin

Bonus Offer

3yr warranty and toner to the value of $129 via redemption

*See www.csw.com.au/promotions

$456 SAVE $43 off RRP WebCode: HPL5933

TRENDnet USB Print Server 1-Port 10/100Mbps

The 1-Port 10/100Mbps Multi-Function USB 2.0 Print Server is designed to transform virtually any stand-alone multi-function USB printer into a shared resource on your network. An intuitive utility application and a user-friendly configuration interface provide a seamless user experience.

$109 SAVE $10 off RRP WebCode: TDN0157

Nitro PDF Professional v5

Create and change PDFs, with the original and best Acrobat alternative.

- Fast, high-quality document conversion
- Do everything you do with paper - electronically
- Quickly edit and PDF any file with best-in-class manipulation tools
- Protect documents with passwords and digital certificates

$158 SAVE $41 off RRP WebCode: NIT0004

Brother HL-2040

A quality entry-level 20ppm mono laser printer for the Windows or MAC user which offers a 600 x 2400 dpi print resolution and optional network capability.

- Up to 1200 dpi class resolution
- 8MB memory
- Parallel & Full Speed USB 2.0
- Up to 250 sheet paper capacity

$143 SAVE $55 off RRP WebCode: BRT0039

Fuji Xerox DocuPrint 204 Mono A4 Laser Printer

If you want low-cost, quality printing with networking capabilities, the DocuPrint 204 is the ideal printer for you.

- 2400 x 600 dpi Resolution
- USB 2.0, IEEE 1284, Ethernet 10/100
- 20 ppm Connectivity
- 250 Sheet Tray
- Compatible with Win9x/ /ME/2000/XP and Mac

Fuji Xerox Printers

$182 SAVE $27 off RRP WebCode: FXP0204

Fuji Xerox DocuPrint 2065 Mono A3 Laser Printer

Fast A4 and A3 speed and high paper capability delivers greater productivity – at an affordable entry level price with economical running costs

- Fast 26 ppm (A4) and 15 ppm (A3) monochrome output.
- Warm-up time less than 16 seconds.
- Large paper capacity meets means greater flexibility to suit your work environment.
- Low cost.
- Network ready.

Fuji Xerox DocuPrint 3055 A3 Printer (FXP3505) $1245

Fuji Xerox Printers

$862 SAVE $127 off RRP WebCode: FXP2065

NETGEAR FWG114P ProSafe Wireless Firewall + USB Print Server

One powerful device, NETGEAR's ProSafe Wireless Firewall + USB Print Server consolidates multiple connection features and gives users the ability to share secure wired and wireless network connections. Built in to this firewall router is a 4-port 10/100 switch, an IEEE 802.11g wireless 54 Mbps access point, and an easy connection USB print server port that supports multiple print jobs simultaneously.

NETGEAR

$187 SAVE $52 off RRP
WebCode: NTG7125

GoldX USB to IEEE1284 Parallel Converter

USB to parallel converter cable that allows you to connect an IEEE-1284 parallel printer to a USB port on a computer.

- IEEE-1284 Nibble Mode Compatible
- Bus Powered (From PC's USB Host Adapter via Connecting Cable)
- Foil and Braid Shielding To Reduce EMI/RFI Interference

$42 SAVE $7 off RRP
WebCode: COM0213

Fuji Xerox Phaser 8560DN - A4 Colour Office Printer

The Phaser 8560 printer gives busy workgroups a fast, affordable, easy-to-use colour printer that can expand from a desktop model to a four-tray, floor-standing powerhouse.

- 30 ppm Mono, 30 ppm Colour
- Up to 2400 FinePoint Resolution
- USB 2.0, Ethernet 10/100 Connectivity
- PCL5c Emulation, Adobe PostScript 3

Fuji Xerox Printers

$1911 SAVE $283 off RRP
WebCode: FXP0562

Fuji Xerox DocuPrint C2100 - A4 Colour Laser Printer

The DocuPrint C2100 redefines colour network printing and is the ideal choice for workgroups that require a high quality printer at a low total cost of ownership.

- 25ppm black 17ppm colour.
- First page out in 17 seconds
- Memory Max 128 MB/ 640MB Ram
- Print Res: 9600x600 dpi
- Up to 60,000 pages maximum monthly duty cycle
- Connectivity -Ethernet 10/100 Base-TX, IEEE1284 parallel and USB 2.0

Bonus Offer

*FREE Toners Value $543
Offer ends 31/10/2007

Buy a DocuPrint C2100 and get a free set of CMYK Toners offer via redemption, see www.csw.com.au/promotions for more info

*See www.csw.com.au/promotions for terms and conditions. Offer ends 31/10/2007

Fuji Xerox Printers

$676 SAVE $692 off RRP
WebCode: FXP2100

Brother HL- 4040CN - A4 Network Colour Laser Printer

- Up to 20 ppm Mono & Colour Printer
- Up to 2400 x 600 dpi resolution
- High Speed USB 2.0 & Ethernet 10/100
- 64MB (expandable - 576MB)
- PCL6 Emulation
- 250 sheets tray

brother

$712 SAVE $387 off RRP
WebCode: BRT0130

Fuji Xerox DocuPrint C3210DX

A Real Workhorse with built-in duplex for Busy Workgroup.

- 30 ppm Mono, 25 ppm Colour
- 1200 x 1200 dpi Resolution
- USB 2.0, IEEE 1284, Ethernet 10/100 Connectivity
- PCL6, PCL5e, Adobe PostScript 3, FX-PDF
- 250 Sheet Tray

Fuji Xerox Printers

$1149 SAVE $169 off RRP
WebCode: FXP3211

OKI C8600 A3 Colour Laser Printer

OKI

- Smallest and fastest A3 Colour on the market, with lowest running costs.
- 26pp mono, 32ppm colour A4
- 15ppm colour, 17 ppm mono A3
- First page out in 10sec
- Windows/Mac
- Duty Cycle 75,000
- USB & Ethernet
- Up to 203gsm paper weight

$2642 SAVE $603 off RRP
WebCode: OKI8600

Fuji Xerox DocuPrint C3055DX A3 Colour Laser Printer

- 35 ppm Mono, 8 ppm Colour
- 600 dpi Resolution
- USB 2.0, IEEE 1284, Ethernet 10/100 Connectivity
- Duplex Printing
- 250 Sheet Tray

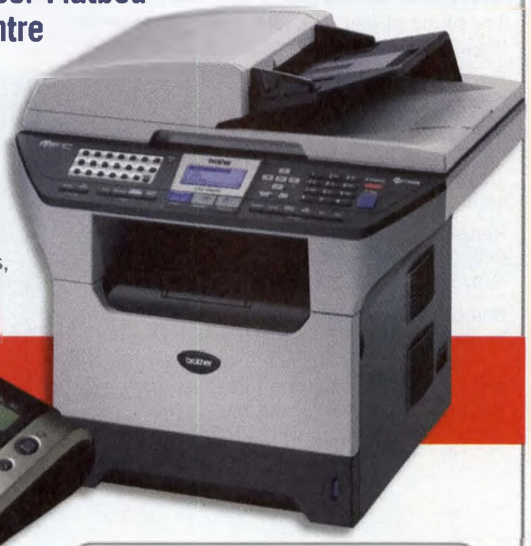
Fuji Xerox Printers

$2368 SAVE $382 off RRP
WebCode: FXP3055

Colour Laser & Multifunction Printers

Brother MFC-8460N "5 In 1" Laser Flatbed Network Ready Multi-function Centre

- Flatbed Copier, up to 28cpm, 1200 x 600 dpi
- Laser Printer, 28ppm, 1200dpi, up to 250 sheets capacity & 50 sheets MP tray
- Colour Flatbed Scanner, 19,200 dpi class (interpolated), scan to key
- Plain Paper Fax, 33.6k bps modem, Dual Access, up to 50 page ADF
- PC-FAX, sends and receives faxes through Windows, sends faxes through Mac



LABEL WRITER PT1280 VALUE AT $99

brother

$796 SAVE $203 off RRP WebCode: BRT0100

Dymo LabelWriter 400

The LabelWriter 400 is one of the fastest printers for printing great looking labels in a second. Print directly from MS Word, MS Outlook and Palm Desktop. Creating labels for envelopes, packages, files, media and name badges are just the beginning.

- 300 dpi Resolution
- USB Connection
- PC and Mac compatible

$147 SAVE $33 off RRP WebCode: DYM0021

Fuji Xerox WorkCentre PE220 Black & White Multifunction

Print, Copy, Fax, Scan

- Print 600 x 600 dpi, Scan 600 x 600 dpi
- 20 ppm
- USB 1.1 (USB 2.0 compatible), IEEE 1284 Connectivity
- 150 Sheet Tray
- Compatible with Win9x/ME, 2000, XP, Mac OS 10.3, Linux

Fuji Xerox Printers

$426 SAVE $73 off RRP WebCode: FXP1220

HP LaserJet 3052 All-in-One

Convenient digital copier, colour scanner with laser printing Compact flatbed design for any office space.

- Multi-page copying with 1,200 x 1,200 dpi resolution
- Professional quality print, scan and copy developed with HP's renowned LaserJet reliability
- First page out less than 8 seconds with Instant-on Technology

$536 SAVE $63 off RRP WebCode: HPL6520

HP Superior Laser Paper Glossy (Q6616A)

HP Superior Laser Paper Glossy provides the weight band and finish of high-quality marketing collateral. The two-sided coating provides a bright, super-smooth, glossy finish that produces photos and images with professionally-printed quality.

- Double sided glossy coating
- 150 A4 sheets
- 160gsm

$25 SAVE $5 off RRP WebCode: HPD6616

OKI C3530 Colour A4 Laser Multifunction

The C3530 MFP enables individuals and small workgroups to print, copy, scan and fax. It's exceptionally affordable to own and run.

- Print Speed: 16ppm Col. 20ppm Mono
- Scan Speed: Up to 20ppm
- Scan Resolution: Up to 4800dpi

OKI

$1476 SAVE $163 off RRP WebCode: OKI3530

Fuji Xerox Phaser 8560D MFP Colour Multifunction Printer

A4 Colour Solid Ink MFP

- Up to 85,000 pages monthly duty cycle
- Print speed of 30 ppm
- First page out in 5 sec.
- Up to 2400 dpi
- Memory 256MB standard, 1GB MAX
- Duplex printing

Fuji Xerox Printers

$3598 SAVE $580 off RRP WebCode: FXP0564

D-Link DPR-1260 - Wireless 108G Multifunction Print Server

Features

- 4 USB 2.0 Printer Connections
- Share Up to 4 USB Printers, Multifunction Printers
- Integrated 802.11g Wireless Interface Ethernet Connection to Wired Network
- Ideal for Office, School, Business Use

D-Link

$187 SAVE $52 off RRP WebCode: DLK9211

CITY SOFTWARE®
Black Tie Service, Plain Wrap Prices®

Wacom Intuos3 6 x 8 Tablet

Seriously-enhanced, Interactive & Creative

Intuos3 is the industry standard graphics tablet for digital art, animation, image editing and computer graphics. The Intuos3 features ExpressKeys and Touch Strip(s) can substitute all common modifiers and shortcuts, whilst the ergonomic pen delivers professional level functionality.

WACOM

$484 SAVE $65 off RRP
WebCode: WAC0630

Excel DVD-R 8X 50pc Spindle

The ideal choice for high resolution video and images. Create, edit and archive home movies & digital photos while storing and accessing data from one disc. DVD-R discs capture 4.7GB.
white Printable surface.

$19 SAVE $20 off RRP
WebCode: EXC0001

Verbatim Mouse Pad with Gel Support

Do you suffer from issues with your wrists whilst using your mouse? Then the perfect way to reduce such issues is with the Verbatim mouse pad with gel support, The Soft Gel plus smooth lycra reduces pressure points for forearm and wrist comfort.

*Mouse not included

Verbatim.

$14 SAVE $6 off RRP
WebCode: VBM1807

Wacom Bamboo Pen Tablet 4x6 A6 Black

The sound of pen on paper is the sound of your thoughts coming to life. It's time to bring that experience by your PC.

Designed to make personalization simple, Bamboo bridges the gap between the real world and the digital world. Personalize your emails, documents, digital photos, even your online chat experience.

Rediscover the joy of writing by hand, Rediscover the Personal in PC, Bamboo reinvents the pen for the 21st Century.

Bamboo's award winning design was conceived to make your experience as natural as using an ordinary pen. The ergonomic shape of the pen and smooth curves of the tablet will help say goodbye to sore hands and fingers that accompany extended use of a PC mouse.

WACOM

$112 SAVE $17 off RRP
WebCode: WAC2002

Microsoft Wireless Notebook Optical Mouse 4000

Plug in the compact receiver when you're ready to work, then snap it into your mouse when you travel, saving hassle and battery life. Easily enlarge and edit details with the new Magnifier and scroll four ways with innovative 4-Way Scrolling.

Microsoft

$48 SAVE $12 off RRP
WebCode: MST8407

Logitech V320 Cordless Optical Mouse for Notebooks - Black

With rubber side grips and a sculpted shape: find comfort anywhere you go with a cordless notebook mouse and storable micro-receiver. Soft side grips, finger grooves, and contoured shape give you more support and control with either hand.

Logitech

$52 SAVE $18 off RRP
WebCode: LOG3645

Logitech MX 620 Cordless Laser Mouse

New concept in PC navigation, this revolutionary alloy scroll wheel operates in two distinct modes: Free-spin Mode for hyper-fast, nearly frictionless scrolling, or Click-to-click Mode for detailed navigation using an ultra-precise ratchet -scrolling mechanism.

Logitech

$75 SAVE $25 off RRP
WebCode: LOG3641

Microsoft Wireless Notebook Presenter Mouse 8000

Do more and carry less with the first ever Notebook Mouse with integrated slide presenter, laser pointer, and media remote control. It's an all-in-one super tool for the office, road, and home the only input device you need.

Microsoft

$113 SAVE $37 off RRP
WebCode: MST8434

Apple Wireless Mighty Mouse

Now you can get the world-famous Mighty Mouse without the tail. With its Bluetooth technology, the wireless Mighty Mouse gives you complete freedom of movement with no cable clutter. It features the popular Scroll Ball that lets you move anywhere inside a document, without lifting a finger. And its laser tracking technology allows it to work on more surfaces with greater precision.

Authorised Reseller

$109 | WebCode: APP0250

Apple Wireless Keyboard

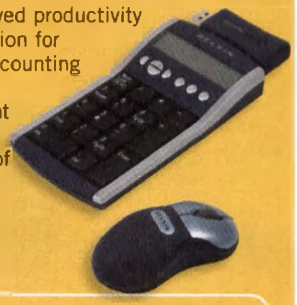
Like its wired sibling, the Apple Wireless Keyboard also features a low-profile, anodised aluminium frame that complements any Mac. It connects using Bluetooth wireless technology, giving you the freedom to work or play either up close or across the room.

Authorised Reseller

$109 | WebCode: APP0316

Belkin Wireless Calculator / Keypad with Wireless Mouse Bundle

The Wireless USB Mini Keypad with calculator and wireless mouse is finished, improved productivity and smart solution for spreadsheet, accounting and financial applications that require fast and accurate entry of numeric data.



BELKIN

$80 | SAVE $20 off RRP | WebCode: BEL2926

Microsoft Wired Desktop 500

Enjoy one-touch access to email, the Web and frequently used features. Control media activities with the touch of a button and work worry-free with a new spill-resistant design.

Microsoft

$33 | SAVE $7 off RRP | WebCode: MST8412

Microsoft Wireless Desktop 1000

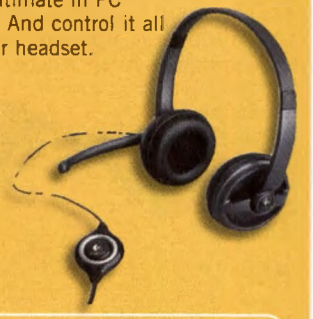
Microsoft Wireless Optical Desktop 1000 offers a complete desktop solution. You get the features that make life easier, like wireless freedom, precision optical performance, and one-touch Hot Keys. All that, plus the reliability you expect from Microsoft, makes Wireless Optical Desktop 1000 one very good deal.

Microsoft

$59 | SAVE $21 off RRP | WebCode: MST8356

Logitech Premium USB Headset 350

Turn it up to 11. Get digital audio in stereo, plus a noise-cancelling mic, for the ultimate in PC calling clarity. And control it all right from your headset.



Logitech

$53 | SAVE $27 off RRP | WebCode: LOG3555

Logitech Cordless Desktop LX 310 Laser

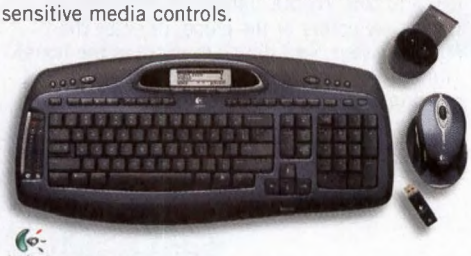
Enjoy one-touch access to your favorite digital music. Use customisable function keys to open applications, files, and folders instantly. Experience unmatched precision and control with the cordless laser mouse.

Logitech

$76 | SAVE $24 off RRP | WebCode: LOG3628

Logitech Cordless Desktop MX 5000 Laser

It's the smart desktop that combines an LCD keyboard display, a high-speed Bluetooth wireless hub with SecureConnect technology, the precision of a MX Laser mouse, and innovative touch-sensitive media controls.



Logitech

$198 | SAVE $72 off RRP | WebCode: LOG3530

Kaiser Baas 8.0 inch Digital Photo Frame - Black

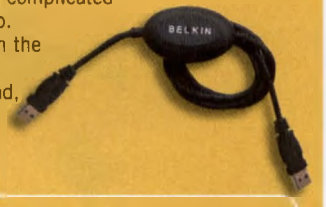
The perfect complimentary product for digital cameras. Forget about printing your digital photos then buying a static frame for it. What about the hundreds of other great shots you took? Show all your digital photos as slideshows with background music in these 2 contemporary design digital photo frames.

- 8.0inch (viewable area) LCD screen
- Interchangeable frames (sold separately)

$286 SAVE $13 off RRP
WebCode: KAB0002

Belkin F3U150 - USB 2.0 File Transfer Cable

The Belkin usb 2.0 File Transfer Cable provides the perfect solution that allows you to copy files from PC to PC without the need to install drivers when used with Windows ME, 2000 or XP. Fantasic for the mobile user to transfer files to and from your laptop without the need of a complicated network setup. Designed with the computer novice in mind, it couldn't be easier!



BELKIN

$65 SAVE $34 off RRP
WebCode: BEL1150

Philips Cordless VOIP Phone

The VOIP433 is a dual DECT phone, which allows you to make or take normal telephone calls on your landline as well as free or cheap calls through Windows Live Messenger. Access your contact list simply by pressing the Messenger key.

PHILIPS

$97 SAVE $62 off RRP
WebCode: PPV4331

Logitech Harmony 525

Control your Home Entertainment system at the touch of only one button. Easy to use with its activities (Watch Cable, Watch a DVD, Play a videogame...), it is also very easy to set up.

$120 SAVE $69 off RRP
WebCode: LOG3594

Logitech Harmony 785

Finally, complete control with one remote. It's like having 15 remote controls in one. Control your entire home entertainment system with the touch of one button.

$276 SAVE $123 off RRP
WebCode: LOG3596

Logitech Harmony 1000i Advanced Universal Remote

The latest and most intelligent evolution of simple, one-touch control. Say goodbye forever to the wasted time and endless frustration of multiple remotes controlling multiple devices. With patented Smart State Technology, one touch is all it takes to effortlessly control up to 15 separate components.

HOT

$485 SAVE $214 off RRP
WebCode: LOG3601

ADS Tech Instant Music

Easy Capture into Popular Music Formats

Just plug the Instant Music into a USB port on your computer and you are ready to begin recording from any analogue audio source into the most popular digital audio formats available such as MP3, WAV and WMA (Windows Media 9 Audio) and AAC.

Convert your old records into MP3's

Available for PC or Mac

$121 SAVE $13 off RRP
WebCode: CNX0001

XPSound XP201- Phono PreAmp for Vinyl Transfer

The "XP201" Phono/Mic pre-amp provides a combination of hard and software to achieve high quality transfer of old records and cassettes to your home desktop PC or laptop in addition to offering a handy high quality microphone pre-amp and headphone amplifier. The included software (Windows PC only) "Diamond Cut 32 V4.0" allows users to professionally edit their recorded audio.

$132 SAVE $67 off RRP
WebCode: XPS0001

Terratec NOXON iRadio

The future of radio. Connect the brilliant Noxon iRadio to your wired or wireless network and listen to over 10,000 Internet radio stations from every corner of the globe, or enjoy the music on your hard drive anywhere in the house. The iRadio is simple and intuitive to use, presorts stations by country and genre, allows you to assign five favourite station buttons.

$407 SAVE $68 off RRP
WebCode: TER5005

Remotec BW6110 - Universal Touch Screen Remote

Are you sick and tired of remote control clutter? Then fix it with the 10 in 1 Home Theatre Master.

- Pre-programmed with learning capability
- EL backlit touch screen panel with intelligent light sensor
- Maximum up to 70 programmable keys per device mode

$175 SAVE $174 off RRP
WebCode: RTC0001

Sarotech HardBox Metal Hard Drive Enclosure

The stylish Sarotech HardBox Metal enclosures allow you to store your most important music, photos videos and much more. Designed to house any 3.5 inch SATA hard drive with capacity up to 750GB. Plug into PC or MAC, and then transfer at high speeds via USB 2.0, Firewire 400 or eSATA. No matter which interface you require this "Triple Interface" wonder can certainly do the job.

- Free Carry Bag
- Luxurious design with advanced aluminium case
- Built in Power Supply
- Fanless - low noise
- Chipset - Oxford 924DS
- Compatible with Windows, Mac OS and Linux

250GB (PWR0204) **$212**
500GB (PWR0205) **$327**

2 Year Warranty

FREE Carry Bag

$97 SAVE $52 off RRP
WebCode: PWR0203

Belkin USB Infrared Smartbeam

The Belkin USB to Infrared Smartbeam lets you easily transfer files, images and data from your printer, handheld computer, cell phone or laptop to your computer. Synchronise your data from your phone or PDA in seconds. The convenient way to make sure you have back-up files of your important information.

BELKIN

$57 SAVE $13 off RRP
WebCode: BEL2591

Comsol 27-in-1 Card Reader

Exchanging data between your computer and Digital Camera, MP3, PDA etc. has never been so fast and convenient.

- Supports almost all of the available storage cards
- Transfer files by user friendly drag-and-drop
- Data can be exchanged between sockets
- Supports Windows 98SE/ME/2000/XP, Mac and Linux
- USB 2

COMSOL

$35 SAVE $14 off RRP
WebCode: COM0102

Logitech Premium 4-Port USB Hub

The Logitech Premium 4-Port USB Hub for Notebooks provides laptop users with high-speed file transfer (up to 480 Mbps) and port indicator lights.

Logitech

$32 SAVE $18 off RRP
WebCode: LOG3644

Belkin High Speed Docking Station

Access all of your multimedia devices with one easy ExpressCard connection that offers high-bandwidth performance, 4x faster than USB.

- Delivers smooth high resolution video (1600 x 1200)
- Enables flawless 5.1 surround sound

BELKIN

$308 SAVE $42 off RRP
WebCode: BEL4003

Comsol USB QuickLink Cables

Assures that you will always have the right connection. Designed for the mobile traveller, the QuickLink cables provide you with 5 different USB or 3 different IEEE1394 FireWire cable configurations for your peripherals.

- Detachable Connectors for added convenience
- Foil and Braid Shielding to reduce EMI/RFI interference
- Includes connector carry case

COMSOL

$28 SAVE $2 off RRP
WebCode: COM0072

Belkin Hi-Speed USB 2.0 7-Port Hub

The latest innovation from USB leader Belkin lets you connect up to seven devices quickly and easily. Our Hi-Speed USB 2.0 7-Port Hub features two, top-loading downstream USB ports. Now you can enjoy fast access for temporary device connections such as USB thumb flash drives, media readers, and for USB lights, fans, and other accessories.

BELKIN

$54 SAVE $25 off RRP
WebCode: BEL0263

Logitech 2.4GHz Cordless Presenter

Take advantage of its 50 foot range to control your presentations while moving around an auditorium with confidence. A built-in LCD timer with vibration alerts helps you effectively manage your time. Storable receiver, carry case and On/Off button for complete portable control.

Logitech

$75 SAVE $55 off RRP
WebCode: LOG3495

Verbatim CD/DVD Markers 4 Pack

- Pack of 4 coloured CD/DVD Markers (one of each blue, black, green and red)
- Water Based
- 0.5mm fine-point soft tip
- Permanent, non-toxic
- Guaranteed 100% safe for writing on CDs and DVDs

Verbatim.

$5 SAVE $1 off RRP
WebCode: VBM1830

Epson Stylus Photo R230

- CD/DVD Printing
- True Border Free Printing
- 5760x1440 Optimised dpi
- Six Individual Ink Cartridges for outstanding photo prints
- USB 1.1 front and rear ports for easy connection

EPSON

$154 SAVE $26 off RRP
WebCode: EPI0230

TFT Screen Clean

For use on all coated and non-coated Laptop, Notebook, TFT, Plasma, LCD, PDA, GPS, Mobile, basically any Screen or Monitor. Extensively tested by Users and Manufacturers, Laboratory and Industry test have shown that Cleansafe will clean and protect all screen surfaces.

$15 SAVE $11 off RRP
WebCode: CLE0001

Imation CD-R Inkjet Printable 50 Spindle

Images, music, and more

Imation CD-R discs store data swiftly and permanently with 1x to 52x write speeds. Our media offers you great performance with low failure rates.

$24 SAVE $6 off RRP
WebCode: MMM0413

Imation DVD+R Inkjet Printable 50 Spindle

Print directly onto Imation inkjet printable CD or DVD discs using a CD/DVD printer. Imation printable discs offer outstanding graphics reproduction and system compatibility.

$35 SAVE $3 off RRP
WebCode: MMM6353

Imation Blu-ray Disc 25GB

Innovative new disc structure using blue laser technology

Supports all format standards for Blu-ray hardware, optical media and content protection specified by the Blu-ray Association

- Extremely fast access speeds will allow interactive use vi broadband web and satellite
- Recorders, players and drives will play standard CD and DVD disc formats (CD-R, DVD-R, DVD+R, etc.). The capability to write standard CD and DVD disc formats is drive dependant.
- Many movie studios and video providers are embracing the Blu-ray format

imation

$32 SAVE $7 off RRP
WebCode: MMM0029

Verbatim Archival-Grade DVD-R 5pk Inkjet 8x

- Proprietary dual reflective layer technology
- Gold layer maximises disc lifetime by protecting data from corrosion
- Silver layer delivers high reflectivity and broad read/write compatibility
- Hard coating protects recording surface against scratches and rough handling

Verbatim.

$14 SAVE $7 off RRP
WebCode: VBM6020

Verbatim DVD-R 16x 50 Spindle

Compatible with up to 16X DVD-R Hardware

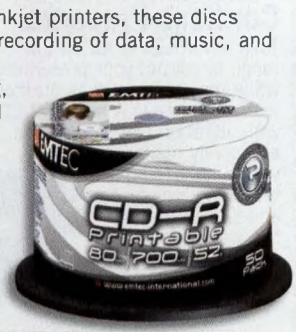
- Advanced Azo recording dye optimises read/write performance.
- Ideal for recording up to 2 hours of DVD quality home movies and video clips.
- Archive and back up, up to 4.7GB of important data
- Limited Lifetime Warranty

Verbatim.

$35 SAVE $8 off RRP
WebCode: VBM5101

EMTEC CD-R 52X 50 Printable

Ideal for use with inkjet printers, these discs enable high speed recording of data, music, and digital images.
Enjoy fast recording, efficient labelling all in a handy stackable package.



$19 SAVE $3 off RRP
WebCode: EMT0010

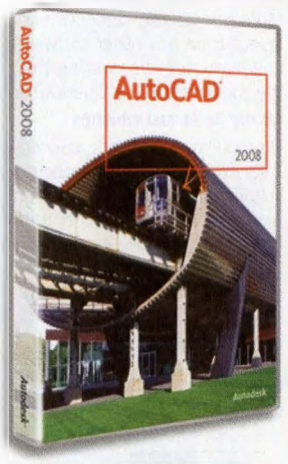
EMTEC DVD+RW 4X 10 Pack Slin

The ability to store data, music, digital images or u to 120 minutes of video makes this product ideal f the user needing temporary back up or to use their disks again and again.

$32 SAVE $7 off RRP
WebCode: EMT0011

Autodesk AutoCAD 2008

Meticulously refined with the designer in mind, AutoCAD 2008 propels day-to-day drafting forward with features that increase speed and accuracy while saving time. Annotation scaling and layer properties per viewport minimize workarounds, while text and table enhancements and multiple leaders help deliver an unmatched level of aesthetic precision and professionalism. For the first time, AutoCAD 2008 is available in either 32-bit or 64-bit versions.



Key Feature Include

- Annotation Scaling
- Layers per viewport
- Enhanced Tables
- Text & Table Enhancement
- Multiple Leaders

Autodesk AutoCAD 2008 Student Version (14 months) (AUT0173) **$154**
- 14 month license - students course record enrolment confirmation required on purchase

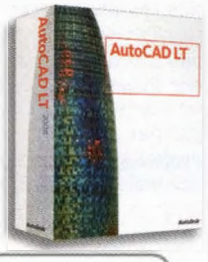
Autodesk AutoCAD 2008 Upgrade from AutoCAD 2007 (AUT0166) **$1698**
Autodesk AutoCAD 2008 Upgrade from AutoCAD 2006 (AUT0167) **$2464**
Autodesk AutoCAD 2008 Upgrade from AutoCAD 2005 (AUT0168) **$3069**

Autodesk

$6788 SAVE $252 off RRP WebCode: AUT0165

Autodesk AutoCAD LT 2008

Streamline your day-to-day tasks with AutoCAD LT 2008 software, the world's number-one-selling 2D drafting and detailing product. Daily work is simpler thanks to tools built with the drafter in mind.



Autodesk AutoCAD LT 2008 Upgrade (AUT0164) **$814**

Autodesk

$1984 SAVE $216 off RRP WebCode: AUT0163

Autodesk AutoSketch 9

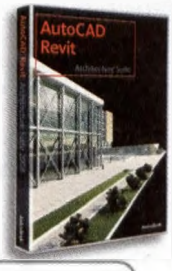
AutoSketch software provides a complete set of CAD tools for creating professional-quality precision drawings. A series of tutorials get you up and running fast. A Microsoft Windows XP–like interface provides a familiar environment for straightforward drafting.

Autodesk

$262 SAVE $13 off RRP WebCode: AUT0077

Autodesk AutoCAD Revit Architecture Suite 2008 Student

With the Autodesk Revit parametric building modeller, you don't have to deal with tedious documentation coordination because the software does it for you.



14 month license - students course record enrolment confirmation required on purchase

Autodesk

$154 SAVE $11 off RRP WebCode: AUT0180

Autodesk Inventor 2008 Student

Autodesk Inventor offers improved workflow functionality and surface-solids modelling tools, increased support for DWF files including password support and print ready format, and key enhancements.

14 month license - students course record enrolment confirmation required on purchase

Autodesk

$154 SAVE $11 off RRP WebCode: AUT0181

Autodesk

Also available Autodesk Subscription

Simplify your technology upgrades and boost your design productivity with the complete software, support, and training package from Autodesk Subscription.

Autodesk Subscription is a maintenance program giving you access to Autodesk's latest software releases and enhancements that keep your design tools up-to-date and make the most of your software investment. With software extensions, downloadable e-courses, a single contract number to manage your software, and the option of Autodesk Direct Online Support, you can simplify your software upgrades and minimize disruptions to your workflow.

Get up to date and up to speed now with Autodesk Subscription. All this for a single annual fee when you buy AutoCAD 2008 or AutoCAD LT 2008 software.

CSW-IT
csw-it.com.au
1300 761 761

Autodesk 3DS Max 9 Student

Create rich and complex design visualization. Generate realistic characters for a top-selling game. Bring 3D effects to the big screen. Autodesk 3ds Max 2008 3D modeling, animation, and rendering software helps design visualization professionals, game developers, and visual effects artists maximize their productivity by streamlining the process of working with complex scenes.

2 year license - students course record enrolment confirmation required on purchase

Autodesk

$258 SAVE $17 off RRP WebCode: DIS0034

Corel Painter X

New Corel Painter X the world's most powerful Natural-Media painting and illustration software, features unique digital brushes, art materials and textures that mirror the look and feel of their traditional counterparts.

Corel Painter X Upgrade (COR8701) **$338**
Corel Painter X Academic (COR8702) **$132**

COREL

$599 SAVE $200 off RRP
WebCode: COR8700

Introducing the new Quark Volume Licensing Program (QVLP) for commercial businesses

- Simplify purchases with one easy serial number
- Reduce costs for managing multiple licences
- Protect investment with Quark Assurance
- Save money with volume price breaks starting with just 2 licences

QVLP licences can also be covered by Quark Assurance, which provides free upgrades and updates for a 24-month period at an additional affordable cost.

Quark Authorized Reseller

CSW-IT
csw-it.com.au
1300 761 761

QuarkXPress 7

Fast. Simple. Robust.

It's the industry standard

More people use QuarkXPress for creative design and page layout than any other software in the world. Period. Millions of users are now discovering the power of the new QuarkXPress 7, the most important QuarkXPress upgrade ever.

All the bells and whistles

QuarkXPress 7 boasts 160 new, innovative features. Take control of transparency with total independence. Create visually stunning graphics from within QuarkXPress 7 – no need to switch to another application. Use the revolutionary Composition Zones functionality to collaborate with multiple users anywhere in the world on the same layout at the same time. Optimize your production workflows with new Job Jackets technology. Work faster with a streamlined user interface and dynamic design tools.

QuarkXPress 7 Upgrade (QUA0042) **$472**
QuarkXPress 7 Academic (QUA0045) **$235**

Quark Authorized Reseller

$1397 SAVE $102 off RRP
WebCode: QUA0040

Corel Paint Shop Pro Photo X2

The easiest way to get professional-looking photos – fast!

With automatic and precision editing tools, plus the Express Lab to help you view and fix photos, Corel Paint Shop Pro Photo X2 is the easiest way to get professional looking photos fast!

New

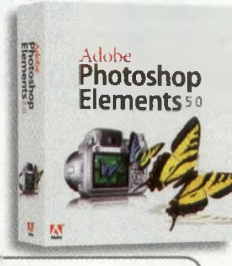
COREL

$143 SAVE $56 off RRP
WebCode: COR9000

Adobe Photoshop Elements 5.0

Adobe Photoshop Elements 5.0 software combines power and simplicity so you can do more with your photos. Instantly fix flaws or adjust color and lighting with new advanced controls. Quickly drop your photos into customisable layouts and show off your creativity with dynamic web photo galleries.

Photoshop Elements 5.0 Academic (AEP9520) **$90**



Adobe

$139 SAVE $30 off RRP
WebCode: ALD9589

CorelDRAW Graphics Suite X3

Transform ideas into professional results with CorelDRAW Graphics Suite X3!

With this comprehensive graphics suite, you can confidently tackle a wide variety of projects from logo creation and Web graphics, to multi page marketing brochures, or eye-catching signs.

BONUS 40GB External HDD via Redemption!

COREL

$548 SAVE $201 off RRP
WebCode: COR8334

Adobe Photoshop Lightroom 1.1

The update includes flexible image management for multi-computer workflows, improved noise reduction and sharpening technology, Windows Vista compatibility, and more. New Adobe Photoshop Lightroom software is the professional photographer's essential toolbox.

Adobe Photoshop Lightroom 1.1 Academic (AEP0028) **$142**

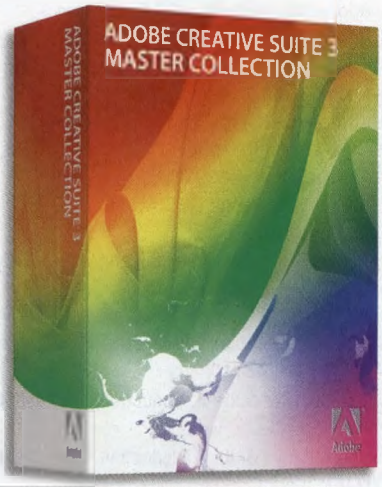
Adobe

$428 SAVE $120 off RRP
WebCode: ALD0053

Adobe Creative Suite 3 Master Collection Upgrade - Windows

Adobe Creative Suite 3 Master Collection combines full new versions of:

- InDesign CS3
- Illustrator CS3
- Dreamweaver CS3
- Fireworks CS3
- Premiere Pro CS3
- Encore CS3
- Photoshop CS3 Extended
- Flash CS3 Professional
- Contribute CS3
- After Effects CS3 Professional
- Soundbooth CS3
- Acrobat 8 Professional
- Adobe Bridge CS3, which also offers direct access to Adobe Version Cue CS3, Adobe Stock Photos, Adobe Device Central CS3, and Adobe Acrobat Connect
- Dynamic Link
- OnLocation CS3
- Capture In After Effects
- Ultra CS3



Adobe Creative Suite 3 Master Collection Upgrade Mac (ALG1034) **$2,089**

Adobe Creative Suite 3 Master Collection Student Mac (ADS0010) **$697**

Adobe Creative Suite 3 Master Collection Student Win (ADS0011) **$697**

Adobe

$2089 SAVE $336 off RRP WebCode: ALG1036

Adobe Creative Suite 3 Design Premium Upgrade - Windows

- InDesign CS3
- Photoshop CS3 Extended
- Illustrator CS3
- Flash CS3 Professional
- Dreamweaver CS3
- Acrobat 8 Professional

Adobe Creative Suite 3 Design Premium Upgrade - Mac (ALG1026) **$853**

$853 SAVE $186 off RRP WebCode: ALG1027

Adobe Creative Suite 3 Web Premium Upgrade - Windows

- Dreamweaver CS3
- Flash CS3 Professional
- Photoshop CS3 Extended
- Illustrator CS3
- Fireworks CS3
- Acrobat 8 Professional
- Contribute CS3

Adobe Creative Suite 3 Web Premium Upgrade - Mac (ALG1042) **$718**

$718 SAVE $147 off RRP WebCode: ALG1043

Adobe Creative Suite 3 Design Standard Upgrade - Windows

- InDesign CS3
- Photoshop CS3
- Illustrator CS3
- Acrobat 8 Professional
- Adobe Creative Suite 3

Adobe Creative Suite 3 Design Standard Upgrade Mac (ALG1030) **$568**

Adobe

$568 SAVE $121 off RRP WebCode: ALG1031

Adobe Creative Suite 3 Web Standard Upgrade - Windows

- Dreamweaver CS3
- Flash CS3 Professional
- Fireworks CS3
- Contribute CS3

Adobe Creative Suite 3 Web Standard Upgrade - Mac (ALG1046) **$597**

Adobe

$597 SAVE $92 off RRP WebCode: ALG1047

Adobe Creative Suite 3 Products

Software	WebCode	Price
Master Collection Academic	AEP0042	$1323
Master Collection Upsell	ALG1037	$2982
Master Collection Full	ALD0073	$3579
Design Premium Student	ADS0007	$420
Design Premium Academic	AEP0037	$788
Design Premium Upsell	ALG1029	$2437
Design Premium Full	ALD0069	$2625
Web Premium Academic	AEP0046	$672
Web Premium Upsell	ALG1045	$2084
Web Premium Full	ALD0077	$2220
Design Standard Student	ADS0009	$280
Design Standard Full	ALD0071	$1787
Web Standard Student	ADS0015	$282
Web Standard Full	ALD0079	$1490

Adobe Photoshop CS3 Extended Student **$216** SAVE $13 off RRP WebCode: ADS0017

Adobe Dreamweaver CS3 **$596** SAVE $93 off RRP WebCode: ALD0083

Software	WebCode	Price
Contribute CS3 Academic	AEP0051	$115
Dreamweaver CS3 Academic	AEP0053	$258
Dreamweaver CS3 Upgrade	ALG1053	$289
Fireworks CS3 Academic	AEP0055	$130
Fireworks CS3 Full	ALD0085	$438
Flash CS3 Professional Academic	AEP0057	$323
Flash CS3 Professional Upgrade	ALG1057	$290
Illustrator CS3 Academic	AEP0059	$261
Illustrator CS3 Full	ALD0089	$858
Illustrator CS3 Upgrade	ALG1061	$294
Indesign CS3 Full	ALD0091	$1003
Indesign CS3 Upgrade	ALG1065	$290
Photoshop CS3 Full	ALD0093	$940
Photoshop CS3 Upgrade	ALG1067	$292

Adobe Licensing Programs

Purchasing under Adobe's licensing programs is your best option when you require multiple copies of Adobe Software.

Key Benefits are:

- Lower software costs.
- Reduced ordering and license administration, simplifying total software management efforts and streamlining internal business processes.
- Web-based license management tool.
- With Upgrade Plan option, technology consis tency across the user base and deployment of the most current technology.
- Greater ability to manage legal compliance

CSW-IT
csw-it.com.au
1300 761 761

More Multi-Media Software

Description	WebCode	Price
Adobe CS3 Production Premium Full	ALD0075	$2,588
Adobe CS3 Production Premium Upsell	ALG1041	$1,811
Adobe CS3 Production Premium Academic	AEP0044	$777
Adobe After Effects CS3 Academic	AEP0035	$478
Adobe After Effects CS3 Full	ALD0067	$1,498
Adobe After Effects CS3 Upgrade	ALG1025	$457
Adobe Audition 2 Academic	AEP9508	$170
Adobe Audition 2 Full	ALD0041	$558
Adobe Premiere Pro CS3 Academic	AEP0033	$482
Adobe Premiere Pro CS3 Full	ALD0065	$1,200
Adobe Premiere Pro CS3 Upgrade	ALG1023	$461
Adobe Soundbooth CS3 Academic	AEP0066	$137
Adobe Soundbooth CS3 Full	ALD0097	$308

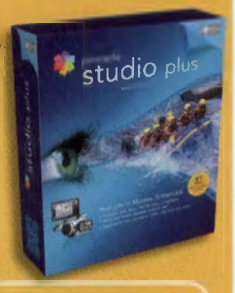
Blaze HDTV Player 2 for Windows
$41
WebCode: BLA0002

Sony Sound Forge Audio Studio 9
$141
WebCode: SON0070

Description	WebCode	Price
Blaze DVD 5 Pro	BLA0004	$63
Blaze DVD Copy 4	BLA0001	$64
Blaze Video Magic 2	BLA0005	$33
CyberLink PowerDirector 6	CYB0032	$143
CyberLink PowerDVD 7 Max	CYB0031	$87
Pinnacle Studio 11	PIN0160	$128
Pinnacle Studio Ultimate 11	PIN0159	$255
Pinnacle Studio Ultimate 11 Academic	PIN0173	$143
Pinnacle Studio Ultimate 11 Upgrade	PIN0158	$60
Reallusion CrazyTalk Messenger Edition	REA0001	$77
Sony DVD Architect Studio 4	SON0062	$88
Sony Sound Forge Audio Studio 9	SON0070	$141
Sony Super Duper Music Looper	SNY0030	$77
Sony Vegas Movie Studio 8	SON0072	$144

Pinnacle Studio 11 Plus

Pinnacle Studio Plus version 11 helps you harness the power of the latest technologies - HD, Windows Vista, Web Publishing and more, without compromising ease of use. Enjoy a full range of automated and advanced features to meet all your video editing needs.



Pinnacle Studio 11 Plus Upgrade (PIN0156) $110

$172 SAVE $27 off RRP
WebCode: PIN0161

Adobe Creative Suite 3 Production Premium Upgrade - Windows

- Adobe After Effects CS3 Professional
- Adobe Premiere Pro CS3
- Adobe Photoshop CS3 Extended
- Adobe Flash CS3 Professional
- Adobe Illustrator CS3
- Adobe Soundbooth CS3
- Adobe Encore CS3
- Adobe OnLocation CS3
- Adobe Ultra CS3
- Adobe Device Central CS3 and Adobe Bridge CS3

Features available only in Production Premium: Adobe Dynamic Link and Capture In After Effects

Adobe Creative Suite 3 Production Premium Upgrade Mac (ALG1038) $1,247

Adobe Creative Suite 3 Production Premium Student Mac (ADS0012) $422

Adobe Creative Suite 3 Production Premium Student Win (ADS0013) $422

$1247 SAVE $138 off RRP
WebCode: ALG1039

Sony Vegas Movie Studio Platinum Edition 8

With Vegas Movie Studio Platinum Edition software you can import and edit video in nearly any format including high definition HDV and Sony AVCHD. Integrated DVD authoring.

Sony Vegas Movie Studio Platinum Edition 8 Academic (SON0077) $164

SONY camcorder

$207 SAVE $32 off RRP
WebCode: SON0071

Ulead VideoStudio 11 Plus

Ulead VideoStudio 11 Plus is video editing and DVD authoring software for anyone who wants to easily produce professional looking videos, slideshows and DVDs. Create amazing High Definition HD DVDs.

Ulead VideoStudio 11 Plus Upgrade (ULE0109) $97

Ulead VideoStudio 11 Plus Academic (ULE0110) $116

COREL

$178 SAVE $21 off RRP
WebCode: ULE0108

Sony ACID Music Studio 7

ACID Music Studio software is the best way to bring your music to life. Multitrack audio and MIDI recording, pro-level editing tools, and over 3,000 ACIDized loops to use in remixes, mash-ups, and original songs.

Sony ACID Music Studio 7 Academic (SON0073) $108

SONY

$138 SAVE $31 off RRP
WebCode: SON0069

Ulead DVD MovieFactory 6 Plus

DVD MovieFactory 6 Plus - Easy to use disc authoring and burning software that lets you do more with your standard or High Definition digital media. Create HD or standard discs with studio quality personalized menus.

Ulead DVD MovieFactory 6 Plus Upgrade (ULE0107) $143

COREL

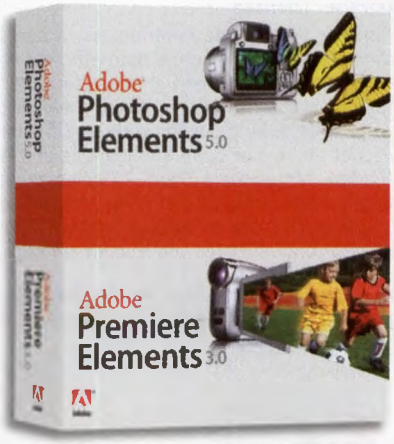
$176 SAVE $23 off RRP
WebCode: ULE0106

Adobe Photoshop Elements 5.0 and Premiere Elements 3.0 Bundle

Complete photo and video editing made easy

Adobe Photoshop Elements 5.0 plus Adobe Premiere Elements 3.0 software combines two powerful yet easy-to-use products to deliver the most complete photo and video editing solution. Entertain friends with unique cinematic slide shows and dramatic freeze-frame effects, create personalized DVDs, and share on the web.

- Put photo slide shows in motion
- Do more with individual video frames
- Include treasured memories in your videos
- Instantly fix common flaws or perform advanced editing
- Show photos in creative, entertaining ways
- Easily find and view your photos and video clips
- Get started quickly creating home videos and DVDs
- Wow your audience with amazing effects
- Share your videos virtually anywhere



Adobe Photoshop Elements 5.0 plus Premiere Elements 3.0 Academic (AEP9528) $135

$217 SAVE $32 off RRP
WebCode: ALD9597

Nero 7 Premium Reloaded

The ultimate PC and home entertainment solution, featuring 20 applications in one attractively-priced, Certified for Windows Vista media suite. Enjoy all your favourite songs with unlimited MP3 encoding support. Turn your mobile devices into full feature-rich portable media centres. Stay connected with free phone calls via the Internet. Burn all types of content onto CDs and DVDs in a wide range of formats including Blu-ray and HD DVD data recording.

$162 SAVE $37 off RRP
WebCode: NER0012

Apple iLife 08 Family Pack

iLife '08, a major update to Apple's award-winning suite of digital lifestyle applications, delivers significant upgrades to iPhoto, iWeb, GarageBand and iDVD, plus a completely reinvented iMovie that offers a revolutionary new way to enjoy, edit and share your video.

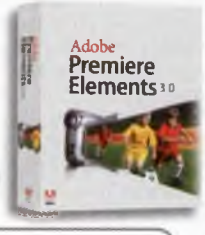
Authorised Reseller

$126 SAVE $3 off RRP
WebCode: APP0324

Adobe Premiere Elements 3.0

Bring your home videos to life

Adobe Premiere Elements 3.0 software makes creating and sharing impressive home videos a snap. Burn your footage to DVD in two simple steps, complete with a DVD menu and scene index, or easily assemble your movie by rearranging clips with drag-and-drop simplicity.



Adobe Premiere Elements 3.0 Academic (AEP9518) $98

$143 SAVE $38 off RRP
WebCode: ALD9585

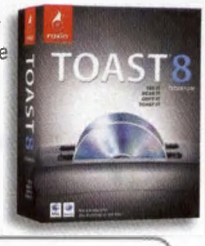
Roxio Easy Media Creator 9 Suite

- Burn music CDs & DVDs, back up fast, and copy with ease
- Take your media with you - easily transfer files to iPod, PSP or other device
- Music, memories, movies and more - any way you want them!

$137 SAVE $42 off RRP
WebCode: ADA9518

Roxio Toast 8 Titanium Double DVD

Roxio Toast 8 sets the standard for burning CDs, DVDs, and now Blu-ray discs on the Mac. Create superior sounding audio CDs with crossfades. Enjoy your TV shows anywhere with exclusive EyeTV burning and TiVoToGo transfers to DVD or iPod. Copy your audio CDs, movies and DVDs. It's your digital life, Toast It!



$116 SAVE $33 off RRP
WebCode: ROX5000

Roxio Crunch

Roxio Crunch will convert your DVDs and movies for use with Apple TV, iPod, and iPhone. Powerful award-winning compression & conversion technologies work together to bring video content from almost any source to your TV or mobile device. Use with your Mac or PC!

$69 SAVE $20 off RRP
WebCode: ROX5001

Microsoft CERTIFIED Partner

Microsoft Volume Licensing

Microsoft Volume Licensing for Small/Medium business (5-250 PCs)

Microsoft Open License is a simple and flexible software volume licensing program designed for customers who order as few as five licenses. Open License benefits include:

- Significant discounts over full retail prices.
- Ability to obtain licenses through multiple locations from a worldwide reseller channel.
- Easier management of license portfolios with eOpen (electronic license management)

Choose the Open License Program that's right for you

The Microsoft Open License program offers you three great ways to save on Microsoft products:

Microsoft Open Business

Open Business is for companies looking to save money without a large up-front volume commitment. The initial order is five or more licenses for any combination of Microsoft products. You can place reorders for two full years and enjoy discounts (as compared to estimated retail prices for Full Packaged Product). There is no minimum reorder quantity.

Microsoft Open Volume

Open Volume is for companies looking to take advantage of volume discounts greater than those offered under Open Business who are in a position to place a minimum initial order of 500 points within a product pool - Applications, Systems, or Servers. Each license carries a unit value of at least one point; some licenses count for higher unit values. And, just as with Open Business, you qualify for the same discount as your initial order when you place additional orders as small as one license throughout the two-year term of your License Agreement.

Microsoft Open Value

Microsoft Open Value is a premium volume licensing offer available under the Open License family. Designed for organisations with as few as five computers, Open Value offers simpler license tracking, greater control over the software upgrade cycle, and better software cost management.

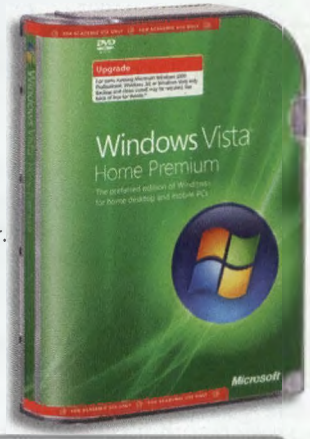
Open Value also offers the advantages of Software Assurance (SA), which includes new version upgrades, technical training, user training, partner services, and product support. These benefits are available through the term of the agreement to improve software resource planning, ROI measurement, and IT professional and user productivity.

Microsoft Windows Vista Home Premium Academic Upgrade

Windows Vista Home Premium is the operating system for homes with advanced computer needs. It will help you use your laptop or desktop PC more effectively as well as enable you to enjoy new, exciting digital entertainment experiences—all with the benefit of added security and reliability.

New user interface

Windows Vista Home Premium has a new user interface named Windows Aero™, which is both efficient and beautiful. This new interface makes it easier than ever before to find your way around the operating system. It even makes it easier to accomplish multiple tasks at once by providing a three-dimensional, real-time, animated view of all of your open applications and documents. Additionally, Windows Vista Home Premium helps you quickly find and organize large collections of documents, pictures, movies, videos, and music. By integrating search throughout the operating system, Windows Vista Home Premium helps you quickly find exactly what you are looking for.

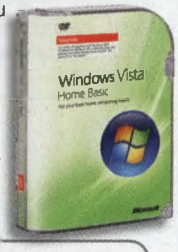


Windows Vista Home Premium Upgrade (MSA5104) $269
Windows Vista Home Premium (MSA5103) $405

$161 | SAVE $18 off RRP | WebCode: MSA5105

Microsoft Windows Vista Home Basic Upgrade

Windows Vista Home Basic is the operating system for homes with basic computing needs. It is easy to set up, it helps you use your PC more securely and reliably, and like all of the editions of Windows Vista, it is compatible with the widest range of software, devices, and services that you use and trust.



Windows Vista Home Basic (MSA5102) $342

$179 | SAVE $20 off RRP | WebCode: MSA5101

Microsoft Windows Vista Business Upgrade

Windows Vista Business is the first edition of Windows designed specifically to meet the needs of small businesses. You'll spend less time on technology support–related issues so you can spend more time making your business successful. Windows Vista Business is the definitive choice for your business today and tomorrow.

Windows Vista Business (MSA5106) $515

$348 | SAVE $31 off RRP | WebCode: MSA5107

Parallels Desktop 3.0 for Mac

The killer app for Mac is now even better than ever!

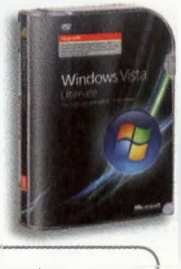
Parallels Desktop for Mac enables you to run Windows, Linux, and more side-by-side with Mac OS X on any Intel-powered Mac, without rebooting. With Parallels' award-winning virtualization technology, you can run Mac OS X and your favorite Windows applications at the same time. You can even drag-and-drop files between desktops!

parallels

$117 | SAVE $27 off RRP | WebCode: PAR0003

Microsoft Windows Vista Ultimate Upgrade

Windows Vista Ultimate is the most comprehensive edition of Windows Vista. It is the first operating system that combines all of the advanced infrastructure features of a business – focused operating system.



Windows Vista Ultimate (MSA5108) $688

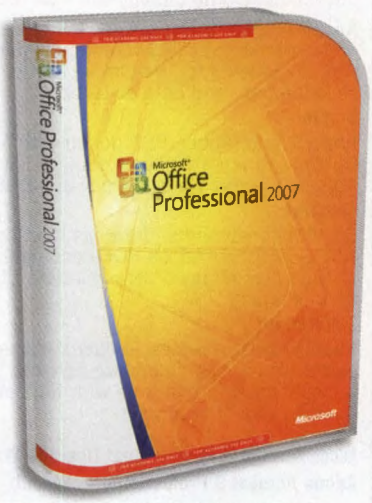
$454 | SAVE $41 off RRP | WebCode: MSA5109

Operating Systems & Office Suites

Microsoft Office Professional 2007 Academic*

Work more efficiently and effectively

New tools help you work faster and create more professional documents, spreadsheets, and presentations. Office Professional 2007 helps you quickly accomplish routine tasks so you can spend more time with your customers. New task-based menus and toolbars automatically display the commands and options you can use, making it faster and easier to find the software features you need. And the Live Preview feature makes it easy to sample your changes before you apply them.



Applications included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- Publisher 2007
- Access 2007
- Outlook 2007 with Business Contact Manager

Microsoft Office Professional 2007 Upgrade (MSA6109) **$487**

Microsoft Office Professional 2007 (MSA6108) **$751**

*Valid also for home/non-comercial use

Office

$247 SAVE $52 off RRP WebCode: MSA6107

Microsoft Office Home and Student 2007 For 3 PC's

Applications included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- OneNote 2007

FOR 3 PC's

*Valid also for home/non-comercial use

Office

$214 SAVE $35 off RRP WebCode: MSA6101

Microsoft Office Small Business 2007 Upgrade

Applications included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- OneNote 2007
- Publisher
- Outlook

Office Small Business 2007 (MSA6105) **$691**

Office

$437 SAVE $62 off RRP WebCode: MSA6106

Microsoft Office Standard 2007 Upgrade

Applications included:

- Word 2007
- Excel 2007
- PowerPoint 2007
- Outlook

Microsoft Office Standard 2007 (MSA6103) **$623**

Office

$377 SAVE $22 off RRP WebCode: MSA6104

Microsoft Office Ultimate 2007 Upgrade

Applications included:

- Word 2007, Excel 2007
- PowerPoint 2007
- Publisher 2007
- Access 2007
- Outlook 2007 with Business Contact Manager
- OneNote 2007
- InfoPath 2007, Groove 2007

Microsoft Office Ultimate 2007 (MSA6111) **$998**

Office

$828 SAVE $111 off RRP WebCode: MSA6112

Software	WebCode	Price
Corel Word Perfect X3 Pro	COR8928	$537
Corel Word Perfect X3 Pro Upgrade	COR8930	$352
Corel Word Perfect 12 Small Business	COR8321	$462
Corel Word Perfect X3 Standard	COR8323	$396
Corel Word Perfect X3 Home Edition	COR8711	$132
Corel Word Perfect X3 Student & Teacher	COR8328	$132
MS Works 9	MSC2940	$66
MS Office 2004 MAC Student & Teacher	MSA3749	$218
MS Office 2004 MAC Standard	MSA3747	$583
MS Office 2004 MAC Standard Upgrade	MSA3748	$352
MS Excel 2004 MAC	MSA3743	$348
MS Excel 2004 MAC Upgrade	MSA3744	$137
MS Word 2004 MAC	MSA3745	$353
MS Word 2004 MAC Upgrade	MSA3746	$129

Corel WordPerfect Office X3 - Upgrade

$114 SAVE $175 off RRP

WebCode: COR8326

Apple iWork '08

$92 SAVE $7 off RRP

WebCode: APP0325

Software	WebCode	Price
MS Access 2007 Academic	MSA6115	$181
MS Access 2007	MSA6116	$353
MS Access 2007 Upgrade	MSA6117	$166
MS Excel 2007 Academic	MSA6125	$187
MS Excel 2007 Upgrade	MSA6127	$165
MS Excel 2007	MSA6126	$363
MS Powerpoint 2007 Academic	MSA6129	$184
MS Powerpoint 2007 Home & Student	MSA6132	$198
MS Powerpoint 2007 Upgrade	MSA6131	$164
MS Powerpoint 2007	MSA6130	$357
MS Word 2007 Academic	MSA6144	$182
MS Word 2007 Upgrade	MSA6146	$165
MS Word 2007	MSA6145	$356
MS OneNote 2007 Academic	MSA6118	$74

Apple iWork 08 Family Pack for Mac

Apple's amazing productivity suite for the Mac, iWork '08 includes three applications: Pages '08 for word processing with an incredible sense of style; Numbers '08 for powerful, compelling spreadsheets made easy; and Keynote '08 for cinema-quality presentations for everyone.

Authorised Reseller

$121 SAVE $8 off RRP WebCode: APP0326

Total Training Programs

Total Training products pioneer in innovative DVD-based training for leading creative design, digital video, and office productivity software programs. Below are some of the training DVD that are available.

Description	WebCode	Price
MS Expression Web: From Front Page	TOT0085	$66
Microsoft Expression Web: Advanced	TOT0084	$132
Microsoft Expression Web	TOT0072	$132
Website Design	TOT0054	$132
Microsoft Visual Studio 2005	TOT0083	$264
MS SQL Windows Server Development	TOT0082	$209
Adobe Premiere Elements 3	TOT0059	$66
Adobe Photoshop Elements 5	TOT0079	$66
Adobe Photoshop CS3 : Advanced	TOT0074	$198
Adobe Photoshop CS3 Essentials	TOT0060	$132
MS Office 2007 : Getting Up to Speed	TOT0071	$132
Adobe Illustrator CS3 : Advanced	TOT0075	$198
Adobe Illustrator CS3 Essentials	TOT0064	$132
Adobe InDesign CS3 Essentials	TOT0065	$132
Adobe Flash CS3 Professional ActionScript	TOT0063	$132
Adobe Flash CS3 Professional Essentials	TOT0062	$132
Microsoft Excel 2007: Advanced	TOT0069	$132
Microsoft Excel 2007: Essentials	TOT0070	$132
Adobe Dreamweaver CS3 Essentials	TOT0061	$132
Adobe Creative Suite 3 Web Premium	TOT0067	$440
Adobe Creative Suite 3 Design Premium	TOT0066	$484
MSASP.NET 2.0 Windows Bundle (Set 1 & 2)	TOT0077	$119
Adobe After Effects Pro CS3 : Essentials	TOT0076	$209
Adobe Acrobat 8 Professional	TOT0057	$165

Adobe Acrobat 8 Professional

Adobe

Communicate and collaborate with the essential PDF solution

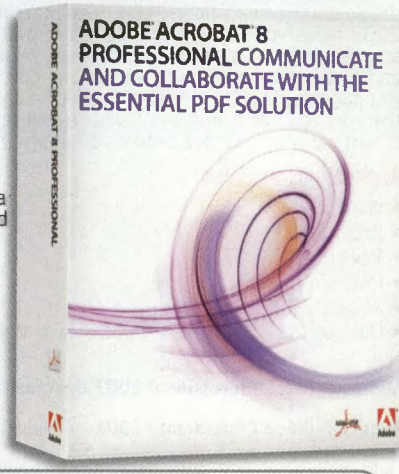
Adobe Acrobat 8 Professional software enables business professionals to reliably create, combine, and control Adobe PDF documents for easy, more secure distribution, collaboration, and data collection.

Create
Easily create Adobe PDF documents from Microsoft Office, Outlook, Internet Explorer, Project, Visio, Access, Publisher, AutoCAD, Lotus Notes, or any application that prints.

Combine
Combine documents, drawings, and rich media content into a single, polished Adobe PDF document. Optimize file size, and arrange files in any order regardless of file type, dimensions, or orientation.

Collaborate
Enable users of Adobe Reader software (version 7.0 or 8) to participate in shared reviews.Use the Start Meeting button to collaborate in real-time with the new Adobe Acrobat Connect line of products.

Adobe Acrobat 8 Professional Upgrade Win (ALG9517) **$217**
Adobe Acrobat 8 Professional Academic - Win (AEP9523) **$205**



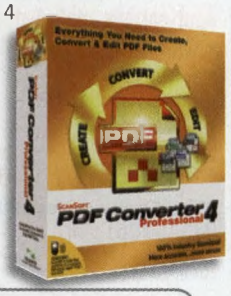
$619 | SAVE $156 off RRP | WebCode: ALD9592

Nuance PDF Converter Professional 4

PDF Converter Professional 4 gives you everything you need to create, convert and edit PDF files – all within one, easy to use application.

PDF Converter Professional 4 (5 User) (NUA0029) **$770**

NUANCE



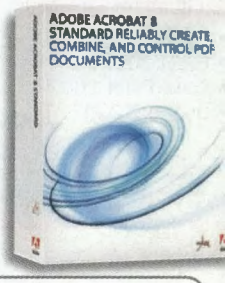
$158 | SAVE $37 off RRP | WebCode: NUA0025

Adobe Acrobat 8 Standard

Adobe Acrobat 8 Standard software enables business professionals to reliably create, combine and control Adobe PDF documents for easy, more secure distribution and collaboration.

Acrobat 8 Standard Upgrade (ALG9520) **$138**
Acrobat 8 Standard Academic (AEP9525) **$123**

Adobe



$413 | SAVE $102 off RRP | WebCode: ALD9595

Microsoft Office Project Standard 2007

Microsoft

Microsoft Office Project Standard 2007 gives you robust project management tools with the right blend of usability, power, and flexibility, so you can manage projects more efficiently and effectively.

Office Project Standard 2007 Upgrade (MSA6143) **$547**
Office Project Standard 2007 Academic (MSA6141) **$104**

$923 | SAVE $110 off RRP | WebCode: MSA6142

Microsoft Office Visio Professional 2007

Microsoft

Office Visio Professional 2007is helping IT and business professionals world-wide visualise, analyse, and communicate complex information, systems and processes.

Office Visio Professional 2007 Upgrade (MSA6150) **$546**
Office Visio Professional 2007 Academic (MSA6148) **$253**

$872 | SAVE $97 off RRP | WebCode: MSA6149

Nuance Dragon NaturallySpeaking 9 Standard + PDF Converter Professional

Dragon NaturallySpeaking 9 Standard

With Dragon NaturallySpeaking Standard you can talk to your computer and watch your spoken words instantly appear in documents, e-mails, and instant messages. Fast, easy and amazingly accurate. No script reading required to get started! Just use your voice to dictate and edit in just about any Windows application including Microsoft Word, Microsoft Outlook Express, Microsoft Internet Explorer, America Online, and Corel WordPerfect. You can even surf the web just by speaking!

PDF Converter Professional 4

PDF Converter Professional 4 gives you everything you need to create, convert and edit PDF files – all within one, easy to use application. Renowned security and mark up capabilities make collaboration and control easier than ever before.

Limited Stock

NUANCE

$197 SAVE $197 off RRP
WebCode: NUA0039

Nuance Dragon NaturallySpeaking 9 Preferred

Dragon NaturallySpeaking Preferred 9 gives small business users and PC enthusiasts the power to create documents, reports, e-mails and more, all by speaking! Fast, easy and amazingly accurate, it's over three times faster than typing.

Nuance Dragon NaturallySpeaking 9 Preferred Upgrade
(NUA0020) **$250**

NUANCE

$321 SAVE $78 off RRP
WebCode: NUA0017

Nuance PaperPort 11

At work and at home you're inundated with paperwork - receipts, bills, letters, tax information, memos, investment statements, contracts, you name it. The paperwork keeps piling up on your desk and documents keep collecting in your PC.

Nuance PaperPort 11 5 User
(NUA0011) **$768**

NUANCE

$162 SAVE $37 off RRP
WebCode: NUA0009

ACT! by Sage 2008 v10

Celebrate the 20th anniversary of the world's best selling contact and customer manager with the release of ACT! by Sage 2008. ACT! helps business professionals connect and succeed.

- New interactive dashboard
- Compatibility with Office 2007 and Vista
- Direct integration with Outlook e-mail

ACT!

$242 SAVE $37 off RRP
WebCode: TCA0113

Nuance OmniPage 16

OmniPage 16 saves time and money by eliminating retyping. Instantly turn paper, digital camera photos, PDF and XPS files into editable electronic documents that look just like the original – complete with text, tables and graphics. OmniPage uses 99% + character accuracy to precisely format your documents so you can easily make changes.

NUANCE

$165 SAVE $34 off RRP
WebCode: NUA0048

NUANCE

The Software Procurement Option for Multi-Seat Licensing

The Nuance Volume License Program (VLP) is a program that enables customers to license software for use, rather than purchase 'boxed' products per user. This reduces product costs by eliminating unnecessary media, documentation, packaging, warehousing, and shipping.The savings are passed on to the customer in the form of a discount off the standard price. It is easy to qualify for the VLP with its low initial purchase requirement.

Program Benefits.

A tiered purchasing program, the VLP offers organizations many benefits:

- Reduces the costs to organizations when purchasing multiple license seats.
- Requires no commitment beyond the first purchase.
- No contract necessary - purchasing is made easy.

How VLP Works

- A license must be purchased for every user (no concurrency)
- Discount level is established by order quantity per product edition.
- An initial order of 10 seats of any one product edition is required to qualify for VLP
- Re-orders for the same product edition may be placed for as little as five seats
- Re-orders must be placed within 60 days of the prior order for the product edition in order to qualify for the same Program Level
- The license delivery consists of a certificate, CD and product manual.

The VLP offers volume discounts on licenses of the following products:

- OmniForm Premium
- OmniPage Pro
- PaperPort Professional
- PDF Converter Professional
- PDF Converter
- PDF Create!

CSW-IT
csw-it.com.au
1300 761 761

FileMaker.

Introducing FileMaker Corporate Licensing Program

FileMaker licensing options give you a choice of licensing and maintenance options designed around the way you work. Our goal is to provide you with the easiest software licensing options ever - no points, no complex contracts, just simple options that let you get the software you need at a price you can afford. For corporate or government organizations CSW–IT specialises in offering the Annual Volume License Agreement (AVLA).

Annual Volume License Agreement (AVLA)

Who should purchase this type of license?

Corporate or government organisations that need at least 10 licenses of FileMaker software. This option provides an easy, flexible way to save time and money on volume licensing.

How Does it Work?

By purchasing an AVLA you are purchasing an annual right to use the software. At the end of the year, you can choose to renew for the next year, purchase the software or de-install the software. If the option is to purchase then a discount is available for each year the software has been installed.

Benefits

- Purchases can start with a low 10-seat minimum.
- Mix and match platforms, products (including FileMaker Pro, FileMaker Pro Advanced, FileMaker Server, FileMaker Server Advanced, and FileMaker Mobile) and upgrades for larger tier discounts.
- No minimums for adding seats to an existing AVLA.
- Volume licensing savings begin at 13% off single user packages; greater discounts for larger orders.
- The AVLA includes 12 months maintenance.

CSW-IT
csw-it.com.au
1300 761 761

FileMaker Pro 9

Finally, an easy-to-use database software for Small Businesses!

Why do so many small businesses choose FileMaker? FileMaker has been helping small businesses dream BIG for more than 20 years. FileMaker gives them the tools they need to easily manage people, projects, assets, and more! It's the #1-selling easy-to-use database. And for good reason, it works as hard as they do!

Software designed to manage business tasks!

- Managing contacts and companies in one place
- Sending targeted personalised mailings to customers
- Generating and tracking job quotes
- Producing invoices and integrating with accounting software
- Processing sales orders and printing shipping labels
- Organising products and inventory
- Tracking projects and production

FileMaker Pro 9 Upgrade (FIL2001) **$283**
FileMaker Pro 9 Academic (FIL2002) **$294**
FileMaker Pro 9 5-pack (FIL2003) **$1893**
FileMaker Pro 9 Upgrade 5-pack (FIL2004) **$1134**
FileMaker Pro 9 Academic 5-pack (FIL2005) **$1182**

FileMaker.

$472 SAVE $27 off RRP
WebCode: FIL2000

FileMaker Pro 9 Advanced

FileMaker

FileMaker Pro 9 Advanced includes all the features of FileMaker Pro 9 plus a suite of advanced development and customization tools to help you design and develop more powerful, more customized database solutions – faster and easier than ever before!

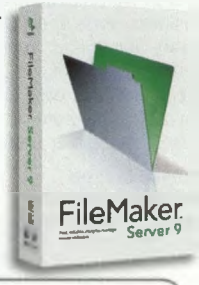
FileMaker Pro 9 Advanced Upgrade (FIL2007) **$467**
FileMaker Pro 9 Advanced Academic (FIL2008) **$487**

$756 SAVE $43 off RRP
WebCode: FIL2006

FileMaker Server 9

FileMaker

Simply install FileMaker Server software on a dedicated computer and upload your FileMaker Pro databases to the server. You and your team will instantly realize how fast and easy it is to access your databases 24/7.



FileMaker Server 9 Upgrade (FIL2010) **$939**
FileMaker Server 9 Academic (FIL2011) **$977**

$1560 SAVE $85 off RRP
WebCode: FIL2009

Microsoft Visual Studio Professional 2005 Academic

Microsoft

Build high-performance solutions faster than ever

Easily create and deploy client applications. Automatically publish and maintain applications and their dependencies with integrated ClickOnce support.

Visual Studio Professional 2005 (MSA9846) **$1250**
Visual Studio Professional 2005 Upgrade (MSA9847) **$852**

$164 SAVE $20 off RRP
WebCode: MSA9866

Microsoft Visual Studio Standard 2005 Academic

Microsoft

Visual Studio Standard Edition is an entrypoint professional development tool that maintains the simplicity of the Express line but delivers access to the powerful development tools necessary to construct data-focused client applications

Visual Studio Standard 2005 (MSA9849) **$459**
Visual Studio Standard 2005 Upgrade (MSA9850) **$305**

$82 SAVE $8 off RRP
WebCode: MSA9848

Crystal Reports XI Professional Edition

Create reports from a large variety of personal and enterprise data sources. Professional Edition is ideal for report designers, database administrators, IT professionals, and power users.

Recommended for Power Users

Crystal Reports XI Professional Edition provides native, ODBC, OLE DB, and JDBC connectivity to relational, OLAP, XML, legacy, and enterprise data. Features include:

Data access

Access almost any kind of data with more than 35 data drivers and tight control over database connectivity.

Formatting and design

Design professional-looking, interactive reports using features like the visual report designer and dynamic prompts.

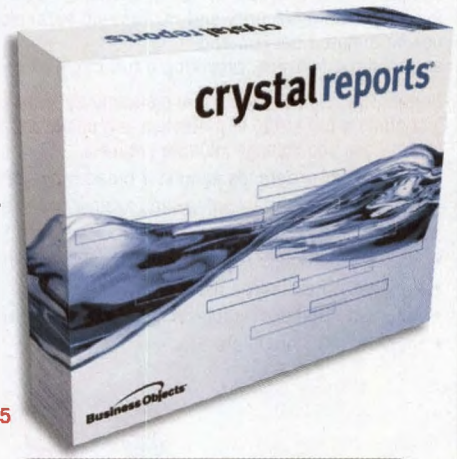
Report viewing and interaction

Make it easy for people in your organisation to view and work with their reports by customising them to match their needs.

Security, support, and maintenance

Learn how Crystal Reports can work within your existing security infrastructure and with other Business Objects tools.

Crystal Reports XI Professional Edition Upgrade (SCR0333) **$385**



Business Objects

*Offer expires 15th November 2007

$746* | SAVE $43 off RRP | WebCode: SCR0332

Crystal Reports XI Developer

Crystal Reports XI is designed to increase productivity and reduce the time spent designing, managing and delivering reports via the web. These features enable you and your end users to experience high quality viewing, printing, and exporting with less effort.

Crystal Reports XI Developer Upgrade (SCR0325) **$484**

*Offer expires 15th November 2007

Business Objects

$898* | SAVE $51 off RRP | WebCode: SCR0324

Crystal Xcelsius Professional Pro

It's a tough crowd. You have to present business data to your customers or colleagues, but you know audiences are easily bored (or, worse, confused) by mind-numbing spreadsheets. And, traditional charts and graphs aren't much better: static, staid, and standardised, they've all begun to look the same.

Crystal Xcelsius 4.5 Pro Upg (pro To Pro) (SCX0008) **$384**

Business Objects

$732 | SAVE $57 off RRP | WebCode: SCX0006

CodeGear JBuilder 2007

Making collaborative development fast and reliable for Java, open source and the web

- Graphical tools that accelerate Web, Java, and Open Source Development
- OptimizeitT delivers advanced debugging and performance tuning
- LiveSource UML Modeling ensures the code and models are always in synch

$726 | SAVE $36 off RRP | WebCode: BOR0180

CodeGear RAD Studio 2007 Pro

Rapid Development of Native Windows and .NET applications

- Includes Delphi, Delphi for .NET and C++Builder
- Build AJAX powered websites with ASP.NET 2.0 and VCL for the Web
- Blackfish SQL - the managed SQL database with support for Delphi language stored procedures and triggers
- Delphi for .NET language support for parameterized types

$1738 | SAVE $94 off RRP | WebCode: BOR0174

Business Objects

The Business Objects Dimensions Volume Licensing Program

Dimensions is Business Objects volume-licensing program that offers customers a cost-effective and convenient way to purchase, manage and maintain Business Objects product licenses and upgrades. Designed to fit the needs of organisations of any size, Dimensions features volume-based discounts, flexible purchasing options, centralised license tracking and easy-to-understand terms.

As a member of the Dimensions program, you'll enjoy substantial cost savings on Business Objects products and services. You can purchase licenses, maintenance and services as needed to accumulate points towards volume-based discounts. With Dimensions, you'll benefit from worry-free volume licensing, while keeping costs down and maintaining consistent licensing throughout your organisation.

Dimensions Open License Plan (OLP) offers customers the opportunity to purchase Business Objects products and services as needed, while tapping into tiered, volume-based discounts. As an OLP member, you are not required to sign a contract, or forecast future purchases.

Points earned through product and service orders are accumulated over a rolling eight-quarter period. After nine quarters, points earned in the first quarter are dropped, and your points are rolled forward into the ninth quarter. You can reorder any quantities at any time during the rolling eight-quarter period, and you'll receive your current discount.

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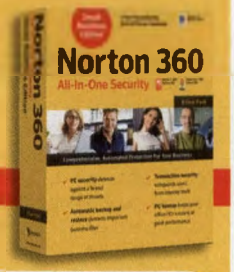
1300 761 761

Norton 360 All-In-One Security 10-User

Norton 360 provides all-in-one protection that keeps you, your family, your PC, and your information secure.

Norton 360 5-User (SYM9745) $164



Less then $33 per PC

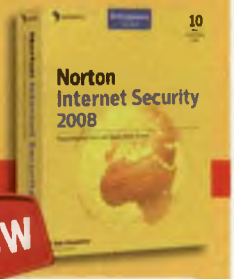
symantec.

$288 SAVE $61 off RRP
WebCode: SYM9746

Norton Internet Security 2008 10-User

Norton Internet Security is always running in the background to detect and block spyware, viruses, worms, crimeware and other risks.

Norton Internet Security 2008 5-User (SYM9770) $124



Less then $25 per PC

New

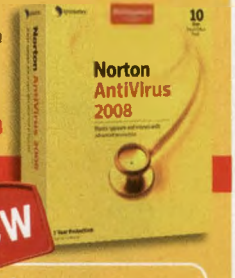
symantec.

$209 SAVE $40 off RRP
WebCode: SYM9771

Norton AntiVirus 2008 10-User

Norton Antivirus 2008 helps block viruses and spyware with advanced protection. Norton AntiVirus 2008 helps protect your entire computer by preventing viruses, spyware and other security risks from harming your system.

Norton AntiVirus 2008 5-User (SYM9767) $108



Less then $22 per PC

New

symantec.

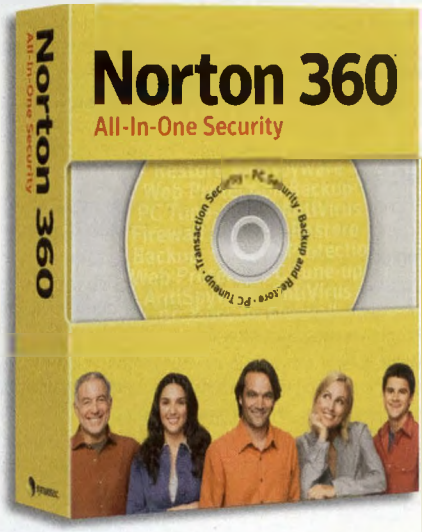
$165 SAVE $44 off RRP
WebCode: SYM9768

Norton 360 All-In-One Security 3-User

Norton 360 provides all-in-one protection that keeps you, your family, your PC, and your information secure. This comprehensive solution combines Symantec's proven, industry-leading security and PC tune-up technologies with new automated backup and antiphishing features, providing a full circle of protection.

Norton 360 is a comprehensive consumer security solution that offers a full circle of protection and eliminates the need to purchase and manage multiple products.

- PC Security – defends against a broad range of threats
- Transaction Security – safeguards against online identity theft
- Backup and Restore – protects important files from loss
- PC Tuneup – keeps PCs tuned for peak performance
- Provides a hassle-free user experience
- Automatic Updates – protects against the latest online threats
- Includes 2GB of Online Storage



symantec.

cnet Editors' Choice 2007

PC March 7, 2007 Norton 360

$108 SAVE $21 off RRP
WebCode: SYM9740

Norton Internet Security 2008 3 User

From the moment you install it, you're getting award winning protection. Norton Internet Security 2008 is always running in the background to detect and block spyware, viruses, worms, crimeware, and other risks

New

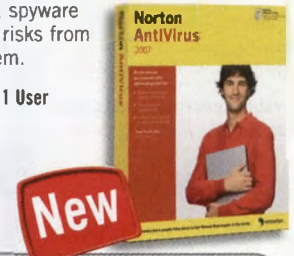
symantec.

$84 SAVE $15 off RRP
WebCode: SYM9769

Norton AntiVirus 2008 3 User

Norton Antivirus 2008 helps block viruses and spyware with advanced protection. Norton AntiVirus 2008 helps protect your entire computer by preventing viruses, spyware and other security risks from harming your system.

Norton AntiVirus 2008 1 User (SYM9760) $44



New

symantec.

$74 SAVE $15 off RRP
WebCode: SYM9766

Trend Micro Internet Security Pro 2008 3 User

Complete protection home and away

- Includes Firewall, Antivirus & Spyware detection and removal
- New System Restore
- 3 User License
- FREE 24/7 Phone Support
- Home network and wireless protection

TREND MICRO

New

$104 SAVE $25 off RRP
WebCode: TRM0017

CA Internet Security Suite 2007 3 User

CA Internet Security Suite provides comprehensive protection against viruses, hackers, identity thieves, spyware, spam and other online threats that can jeopardise your privacy, your data, and your PC's performance.

Bonus 2GB Flash dirve

Bonus Offer

ca

$77 SAVE $22 off RRP
WebCode: CAI0002

Microsoft Windows Live OneCare 1.5

Help get peace of mind knowing that everything is managed for your virus and spyware scanning, firewalls, tune-ups, file backups, the whole nine yards. And it's all delivered to you in a smooth, hassle free package. Windows Live OneCare is a comprehensive PC health service that goes beyond security to take an integrated approach to help protect and care for your computer.

Introducing Windows Live OneCare, the all-in-one, always-on PC care service from Microsoft. It works quietly in the background on your computer, so you don't have to worry about nasty interruptions from viruses, spyware, hackers, and other unwanted intruders. It also goes beyond security, regularly backing up all your important files and cleaning up and tuning up your computer to help keep it running at top speed. Because you have better things to do with your PC.

All-in-one protection and maintenance

Windows Live OneCare helps protect your computer, and its automated optimization features keep your PC running at its speediest. OneCare even regularly backs up your important files.

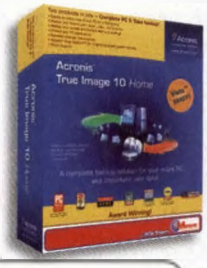
3 User

$73 | SAVE $27 off RRP | WebCode: MSA6100

Acronis True Image 10 Home

New Features of True Image 10 Home:

- Backup Outlook
- Backup your music, video, and digital photos
- Protect your applications
- System Imaging
- One-Click Restore



$63 | SAVE $16 off RRP | WebCode: MAN0089

BullGuard Backup

BullGuard Backup allows users to schedule automatic online and/or local backups of key documents such as email files, photos and music. Online backups provide the ultimate form of data security as files are stored outside your laptop or PC.

- Supports both online and local backup
- Encrypted data transfer
- The online backup drive can be accessed from anywhere in the world

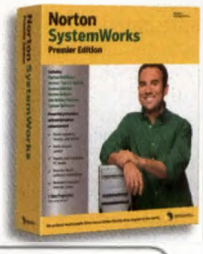
5GB Online Storage

$55 | SAVE $10 off RRP | WebCode: BUL0003

Norton SystemWorks Premier Edition

Get powerful system protection and performance enhancement with Norton SystemWorks Premier Edition

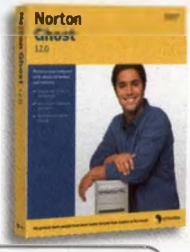
- Backs up your system
- Repairs and maintains PC health
- Reverses failed software installations
- Removes unneeded Internet clutter



$83 | SAVE $16 off RRP | WebCode: SYM9723

Norton Ghost 12

Symantec's Norton Ghost 12.0 protects your computer with advanced backup and recovery. It includes the backup protection you expect, with powerful new features such as enhanced performance, available one-to-one remote management, LightsOut Restore capability, and more.



$88 | SAVE $11 off RRP | WebCode: SYM9908

Description	WebCode	Price
Bullguard Internet Security	BUL0001	$83
CA Anti-Virus 2007 3 User	CHY2011	$68
CA DNA Migrator 2007	CHY2036	$48
McAfee Internet Seccurity 2007 3-User	MCF2146	$80
McAfee Total Protection 2007 3-User	MCF2151	$104
McAfee VirusScan Plus 2007 3-User	MCF2138	$64
Net Nanny 5 Special Edition	NAN0001	$43
Norton Partion Magic	SYM2560	$95
Norton Save & Restore	SYM9901	$58
PC Tools Privacy Guardian 4.1	PCT0003	$46
PC Tools Registry Mechanic 2007	PCT0002	$46
PC Tools Spyware Doctor 2007	PCT0001	$46
Trend Micro Mobile Security 2008	TRM0013	$44
Zone Alarm Inte. Sec. Suite 2007 3 User	MAN0092	$79

CA Business Protection Suite for Windows Server v3.1 - 5 User

CA Business Protection Suite is the first integrated solution for SMBs combining security, backup and desktop migration to help reduce risks, downtime and IT costs.

10 User (CHY9311) $1,597
25 User (CHY9312) $2,696

New

$1197 | SAVE $335 off RRP | WebCode: CHY9310

CA Business Protection Suite for Microsoft Small Business Server v3.1 - 5 User

CA Business Protection Suite for Microsoft Small Business Server integrate security, backup and desktop migration solutions to help SMBs reduce risks, downtime and IT costs.

10 User (CHY9315) $1,347
25 User (CHY9316) $2,497

New

$934 | SAVE $271 off RRP | WebCode: CHY9314

MYOB BusinessBasics

Manage all your basic business tasks from the one easy program, designed specifically for small or home-based Australian businesses. Streamline the data entry and reconciliation side of managing your business with MYOB BusinessBasics, and free up your time to focus on running it.

MYOB Business Basics is ideal if you:

- Run a small or home based business
- Employ no staff
- Have no inventory

MYOB

$128 SAVE $21 off RRP
WebCode: MYB0004

Quicken Personal Plus 2007

Easy home finance & investment organiser

Provides tools to help you manage your finances, prepare for tax time and plan for the future, plus exclusive tools to help you optimise your investment portfolio and maximise tax-saving opportunities.

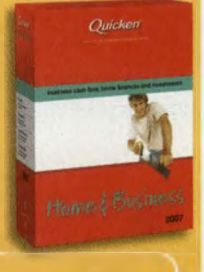
- Track all of your personal and business bank accounts, credit cards, income & expenses
- Budgeting tools to help you save and plan for your future
- Use the new ASIC FIDO superannuation calculator

Quicken

$162 SAVE $17 off RRP
WebCode: QUI0121

Quicken Home & Business 2007

Quicken Home & Business 2007 business cash flow, home finances & investments Combines the best of investing and basic business cash flow management to assist you in combining your personal and business finances, allowing you to obtain a complete picture of your financial wealth. It is designed specifically for businesses that operate using a cash-basis accounting method and do not require reporting on outstanding invoices.



Upgrade (QUI0123) $177

Quicken

$390 SAVE $39 off RRP
WebCode: QUI0122

QuickBooks Plus 2007/08

Timesaving features and powerful functionality make this a must-have for efficiency-minded businesses. It's designed for businesses that track payroll.

- Integrated payroll management
- Track inventory
- Process credit card payments
- Import bank statements
- Track GST & BAS
- Keep track of your business with over 100 reports and graphs
- Compatible with Microsoft Windows 2000/XP/Vista
- 12 months free technical phone support and upgrades

- Receive QuickBooks 2008/09 automatically
- *Switzer offer valued at $2000

$150 Cashback

Upgrade (QUI0131) $367
Subscription (QUI0134) $240

Quicken

*See www.csw.com.au/promotions for terms and conditions. Offer ends 31/10/2007

You Pay $527
$377* After cashback SAVE $202 off RRP
WebCode: QUI0128

QuickBooks Pro 2007/08

Tracks stock and comes with advanced tools to help increase efficiency and accuracy. Including all the basic accounting functionality of QuickBooks Plus, it adds advanced productivity tools such as integration to the MS Office suite and MS Outlook.

- Receive QuickBooks 2008/09 automatically
- *Switzer offer valued at $2000

$150 Cashback

Upgrade (QUI0132) $485
Subscription (QUI0135) $298

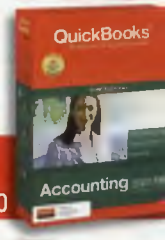
Quicken

*See www.csw.com.au/promotions for terms and conditions. Offer ends 31/10/2007

You Pay $744
$594* After cashback SAVE $255 off RRP
WebCode: QUI0129

QuickBooks Accounting 2007/08

An effective software package specifically tailored for small businesses that don't need payroll or stock tracking, but do need to track more than money in and money out.



- Compatible with Microsoft Windows 2000/XP/Vista
- 12 months free technical phone support and upgrades

- Receive QuickBooks 2008/09 automatically
- *Switzer offer valued at $2000

*See www.csw.com.au/promotions for terms and conditions. Offer ends 31/10/2007

$266 SAVE $33 off RRP
WebCode: QUI0127

QuickBooks EasyStart 2007/08

Designed for fist-time users of accounting software, EasyStart includes simple, practical tools to manage essential business tasks. No confusing set-up. No unnecessary features. Just common sense tools that are easy to set up and easy to use.

- Manage GST and BAS
- Reconcile your bank account
- Compatible with Microsoft Windows 2000/XP/Vista
- *Switzer offer valued at $2000

*See www.csw.com.au/promotions for terms and conditions. Offer ends 31/10/2007

$112 SAVE $17 off RRP
WebCode: QUI0126

MYOB Accounting 17

With MYOB Accounting's inventory management system you'll know what's in stock, what's on order and what's committed. The inventory management system is integrated with the sales and purchases features, so your stock listing is always up to date and accurate.

MYOB Accounting 17 Upgrade (MYB0078) $228

MYOB

$282 SAVE $67 off RRP
WebCode: MYB0074

MYOB Accounting Plus 17

MYOB Accounting Plus helps you manage your business and your payroll with ease.

It has the same business management features as MYOB Accounting.

It also:

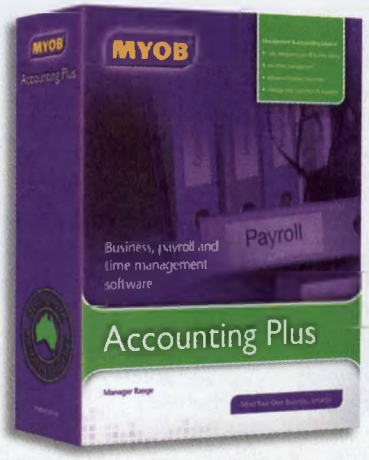
- Automates your Pay Runs
- Calculates PAYG withholdings
- Works out your superannuation and then updates all your accounts automatically

Ideal if you ...

- Provide professional services
- Have employees

Features & benefits

- Automate your payroll - no more paperwork, tracking or calculating each time you pay your staff
- Bill for your time the way you want to - track activities and expenses so you know exactly how much each job costs
- Manage all your banking requirements - track as many cheque, credit card and savings accounts as you need



MYOB Accounting Plus 17 Upgrade (MYB0079) $296

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Quicken Retail Starter Kit 07/08

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Quicken Retail Point of Sale 2007/08

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Bob Madden
Kuranda, Queensland

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Bill Gwynne
New Norfolk, TAS

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Russell MacKinnon
CSIRO IT Support

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Thanks,

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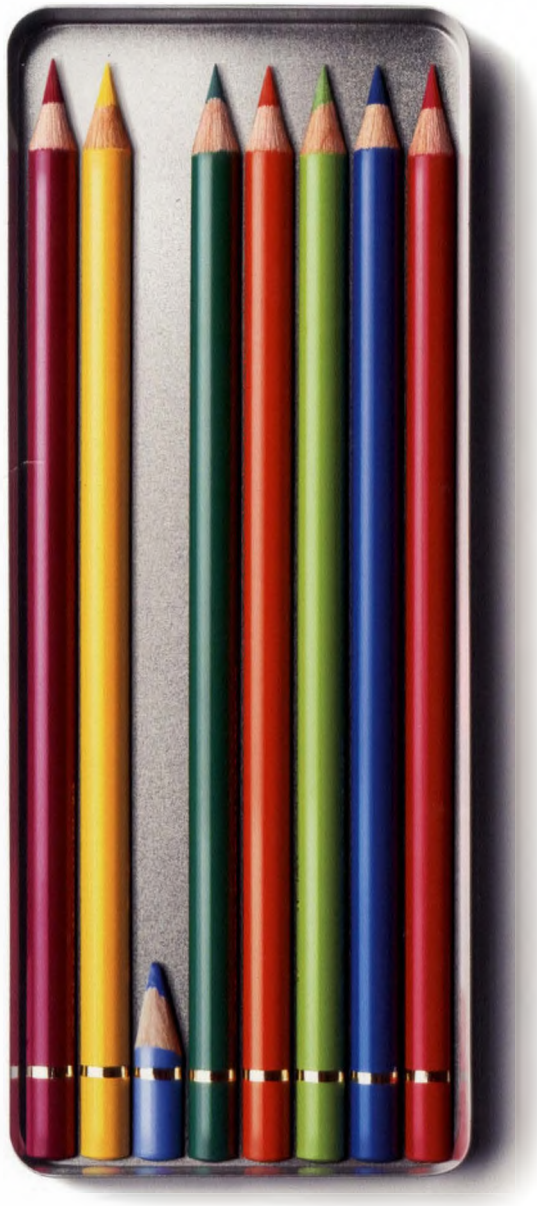

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